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RELATIONSHIP OF PARENTS' DOGMATIC AND IRRATIONAL THINKING TO THEIR CHILDREN'S CREATIVE AND IRRATIONAL THINKING

by

© Linda L. Lees

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

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EDMONTON, ALBERTA

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THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled Relationship of Parents' Dogmatic and Irrational Thinking To Their Children's Creative and Irrational Thinking submitted by Linda L. Lees in partial fulfilment of the requirements for the degree of Master of Education
in Educational Psychology.

.....H.W. Bentler.....
Supervisor

.....D. Kay Lamy.....

.....Joyce E. Devine.....

Date....Oct. 11/78.....

This thesis is dedicated

with love

to the friends in my family:

John Bartlett Lees,

Matthew Crawford Lees,

and

Holly Ann Lees.

ABSTRACT

A random sample of 100 families comprising two parents and one or more children between the ages of 11 and 16 years were tested to determine what relationship exists between the dogmatic and irrational thinking of the parents and the creative and irrational thinking of their children.

Comparisons between three age groups (11 and 12, 13 and 14, and 15 and 16 years) and the two sex groups (sons and daughters) were made.

Rokeach's Dogmatism Scale, form E and the Adult Irrational Ideas Inventory were administered to the parents. Torrance's Test of Creative Thinking, Figural Form B and the Irrational Ideas Inventory were administered to the children. The data were tested with a two way analysis of variance and a Scheffé test for multiple comparisons where a significant difference existed.

No relationship was found between the parents' dogmatic thinking and their children's creative thinking. However, highly irrational parents were found to have highly irrational children. Younger children were found to be significantly more irrational than older children. Daughters were found to be significantly more irrational than sons. No relationship was found between the parents' dogmatism and the children's irrationality. Nor was there any relationship found between the parents' irrationality and the children's creativity. There was no relationship found between the level of creativity of the age groups or of the sex groups.

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I. INTRODUCTION AND STATEMENT OF PROBLEM

> The history of man is the unfolding of his potential - it is also the key to his future... The greatest challenge any person faces is his realization and release of his own potential. (Otto, 1968, p. 110)

The release of human potential is a creative activity and may well be the foremost responsibility of man in order to ensure his survival as a species. This study examines two of the variables: parents' dogmatism and the irrationality of the parents and of the children which may assist in the release or restriction of creativity or human potential in children.

It has been documented by Bandura (1969) that a relationship exists between the behavior of parents and the behavior of children, i.e. a child's behavior appears to be largely modelled after his parents' behavior. Examination of attributes of the thinking process may prove a useful tool in understanding parent-child interactions and relationships.

The purposes of this study are: a) to determine whether a relationship exists between the level of dogmatism of parents (high or low) and the creative thinking of their children, b) to determine whether a relationship exists between the level of dogmatism of parents (high or low) and the irrational thinking of their children, c) to determine whether a relationship exists between the level of the irrational thinking of the parents (high or low) and the irrational thinking of their children, d) to establish

whether any sex related differences are present in the children, i.e. whether sons and daughters are differentially related by dogmatism in their parents, and e) to examine age as a variable of the aforementioned relationships.

II. LITERATURE REVIEW

A. Introduction

The amount and complexity of knowledge available for assimilation and application have steadily increased through the centuries. This growing mass of information has had an effect on the individual and on his survival. It can be seen that human survival in a rapidly changing world depends on the increased use of an individual's potential. William James (in Otto, 1968) stressed this at the turn of the century, when he observed that man was functioning at 10% of his potential. More than ever before, society is in need of innovative and creative thinkers to formulate solutions to problems which threaten the existence of the human species (Guilford, 1962; Osborne, 1957; Rogers, 1961; and Torrance, 1965). People of vision and judgement are essential, since past solutions to problems are inadequate in solving problems today. Finding new solutions requires people who have developed their own unique creative potential (Arasteh and Arasteh, 1968; Barron, 1969; Harding, 1958).

Taylor (1964) sums this up as follows:

> Because creative acts affect enormously not only scientific progress but society in general, those nations who learn best how to identify, develop and encourage the creative minds and potential in their people may find themselves in very advantageous positions. As few as three or four highly creative minds can make a crucial difference... creativity at its highest level, has probably been as important as any human quality in changing history and in reshaping the world. (Taylor, 1964, p. 2)

B. Changes in Family Style Through History.

The family is seen here as the basic unit in society for promoting the development of creativity in individuals. Gradually through the ages we have progressed from outright barbarism common in early times to a democratic family style (de Mause, 1974; Robertson, 1974; Stone, 1974). From early times into the 19th century families were characteristically authoritarian. They placed rigid limitations on behaviors, activities, values, and styles of communication. The severity of these limitations was influenced by such external factors as economics, war, puritanical beliefs in sin and the devil, as well as by some internal factors such as the stage of development of the individual parents. Parents became a little more permissive and affectionate in the 18th century, mainly due to a rising humanistic interest in the individual. A parenting style, sometimes referred to as democratic parenting, also gradually evolved. This evolution in parenting styles reflects the changes in the values and attitudes of society.

The democratic or responsible freedom style of family interaction stresses the unique individuality of each family member and is sensitive to the different needs of each person. This may encourage expression of the individual's creative potential. Behavioral limits are also set which take into consideration the needs of each family member (Coopersmith, 1967). This style of democratic family life emerges in the work of authors such as Dreikurs (1974), Gordon (1970), and Robertiello (1975). It is expected that domineering, restrictive, dogmatic parenting, reminiscent of parenting until the 1900's, will restrict the creative expression of their children to the degree that a significant relationship will be revealed between highly creative children and less dogmatic parents. In order to determine if creativity is affected by any factors existing in a parenting style, the word creativity must be defined.

C. Definition of Creativity.

Creativity has been defined in many ways; some definitions focus on the product created while others deal with a thinking process. Ausubel (1967), for example, believes the creative person will produce unusually original contributions to art, science, literature, philosophy, government, and so on. In keeping with this view, Barron (1969) believes the product must fill a need in contrast to being original but useless. For example, the word-salad of a

schizophrenic shows elements of creativity, but fulfills no societal need, and the product must meet the need of the present rather than of the past or of the future. Skager, Schultz, and Klein (1965) share Barron's views.

According to H.H.Anderson (1959) spontaneity is creative behavior in the relative absence of environmental threat or coersion. Though spontaneity is thought to be a necessary part of creativity, this definition is considered to be too limited for this study.

Torrance (1966) defined creativity as follows:

> A process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies and so on; identifying the difficulty, searching for a solution, making guesses or formulating hypotheses about the deficiencies; testing and retesting the hypotheses, and possibly modifying and re-testing them; and finally communicating the results. (p. 6)

This process enables a person to 'brainstorm' by allowing the mind to think of many unrelated kinds of solutions to a problem (divergent thinking) rather than just one. A process of logic is then used to select from the many diversified ideas, the most logical and original answer (convergent thinking) (Gilchrist, 1972).

Convergent thinking is required in intelligence tests and typical classroom exams. It requires the absorbing of information and memorizing of specific answers to specific problems. Creative thinking appears to be a cognitive process going from divergent to convergent thinking.

Anderson and Anderson (1965) observed that the condition fostering creativity is an open system in which

the individual is accepted and stimulated by another person and is able to be unique and honest. This sense of freedom and acceptance is necessary if potential creativity is to be released (Anderson and Anderson, 1965; Boersma and O'Bryan, 1968; Dellas and Gaier, 1970; Gibb, 1972; Maslow, 1971; Rogers, 1961). Alamshaw (1967), like Rogers (1961), says that harsh or premature criticism of one's work will block its creativity.

For the purpose of this study, Torrance's definition of creativity is being used.

D. Family and School Influence on Creativity.

Some theorists such as Anderson (1959) and Rogers (1961) saw environment as a critical condition for creativity. In some environments there is stimulation and freedom to behave naturally and spontaneously. In other environments there is caution, inhibition and suppression of ideas.

The school may be seen as reinforcing or opposing the values established in the home (Barron, 1969; Lemire, 1972; Paterson and Nichols, 1968). Paterson and Nichols (1968) explored the effect that authoritarianism in the classroom has on creativity and found creativity is significantly reduced. Getzel and Jackson's (1962) study, using 52 subjects with a mean IQ of 132, emphasized that the 'highly creative and less intelligent' pupils were less popular with

their teachers and less accepted by both teachers and peers than the 'highly intelligent and less creative' pupils. There was an indication that creativity was maintained at some cost to personal security. In a parallel study, Torrance (1967) showed that creative thinking abilities were disapproved of by peer groups. This peer group pressure was just as important as teacher disapproval in suppressing creative thinking. This indicates that the attitudes and values of others do influence the demonstration of creative thinking.

Pong's (1968) socio-historical survey revealed that Darwin, Edison, Einstein, Faraday, Hobbes, Newton, Pasteur, Poincarre, and others either nurtured a strong antipathy towards the school system or performed poorly. Sir Winston Churchill is another example. All of these highly creative people found functioning in the more rigid authoritarian school environment difficult or not worthwhile. Paterson and Nichols (1968) found, in an analysis of Edmonton Public High Schools, that one reason for dropping out of school was a general lack of interest in school work (17.8%). It is likely that some of these 'drop-outs' would be unstimulated, highly creative students. Alamshaw (1967), Frenkel-Brunswick (1949), Nichols (1964), Smeltzer, 1966, and Strodtbeck (1958) all discuss the negative effects of authoritarianism on creative thinking in either school or home environments.

In Edmonton, Caraway Creative Learning Centre, an alternative education public primary school, whose

philosophy is based on the principles of free and responsible expression and behavior, and discovery learning, finds that the students excel above the mean in math and reading while continuing to develop their creative abilities. These students may not represent the normal population as their parents all deliberately chose the school and agreed to commit themselves actively to the program. The parents are mainly representative of the middle to upper socio-economic population. Most parents are themselves highly motivated and educated, setting a standard in the home for the child to model. Besides modeling as an explanation for these findings Wodtke (1964) and Yamamoto (1965) each found the Torrance Test of Creative Thinking (TTCT) components are significantly correlated with IQ, suggesting that these children may be highly creative and have higher than average intelligence quotients. This possibility is not being explored here.

Ellinger (1964) found that creative students in grade 4, as measured by the TTCT, were more involved in family activites while Dauw (1966) found high involvement of creative children with the parent of the opposite sex. These findings suggest that greater family relating or involvement is another factor in creativity.

Coopersmith (1967) has discovered a significant positive relationship between the degree to which parents allow their children to think for themselves, to make decisions for themselves, to be validated as worthwhile, to

be contributing members of the family group, and the degree of self-esteem the child holds. He found that a reasonable amount of limit setting and firm and consistent parenting left the youth secure. A good self image prevailed, which in turn freed the person to develop creatively. In studies of normal middle class families, Coopersmith also found that children from homes with democratic procedures are generally self confident, competitive, and assertive. In addition, they were found to be more spontaneous and original as well as being inclined to pursue their activities with greater tenacity. If both home and school are rigid and authoritarian, a child may find it very difficult to explore and to be expressive in a creative way.

> Children and adolescents continue to be victims of this cultural heritage of domination and usurpation, these biases, fears, anxieties, and compulsions of parents and teachers who are afraid to permit children to think and act for themselves. ...The predicted outcome of this cultural domination is loss of "motivation" and revolt, or conformity, submission, and psychic atrophy (Anderson and Anderson, 1965, p. 53).

E. Conditions in the Home Fostering Creativity.

Parental behavior, attitudes, and values are reflected by their children (McCord, McCord and Howard, 1961). Arasteh and Arasteh (1968) concluded that highly creative youths seem to strongly identify with their fathers, especially those creative students who enter the arts and humanities. By contrast, Arasteh and Arasteh (1968) reported that

immigrant scientists, in childhood, respected but felt distant from their fathers. A lack of closeness in families which seemed to foster creativity is evidenced in other research as well (Weisberg and Springer, 1961). These studies indicate that lack of family involvement may foster creativity, which is in contradiction with Ellinger's findings. It is possible that the age of the child, whether involved or not involved, may be the factor that would explain this contradiction. For instance, Ellinger (1964) was studying fourth graders while Arasteh and Arasteh (1968), Dauw (1966), and Weisberg and Springer (1961) did not state the age they were studying. The ages of the subjects may have been different from Ellinger's and this may have accounted for the difference in their findings. The age of the child when involved, or in close contact with his family may affect his expression of creativity differently from another child of a different age, assuming involvement is related to age.

Domino (1969) examined mothers of creative and non-creative high school males and found that the mothers of creative sons exhibited significantly greater self assurance, initiative, and interpersonal competence than mothers of non-creative high school males. The mothers of creative sons preferred change and unstructured demands; they had greater insight about others, were more tolerant, and valued autonomy and independent activites. They were less observant of the failings of their sons. This agrees

with Getzel and Jackson (1962). Unfortunately, a study of fathers was not conducted in this study which leaves same-sex modelling conclusions incomplete. Possibly a factor in these studies was that the children had two parents who were creative themselves or displayed characteristics of a creative personality and not just one creative parent as was implied in the study. Burkhart (1960) found that creative children came from permissive or mother dominated homes. Dreyer and Wells (1966) studied a group of 25 four and five year old children. They found that parents of highly creative children had less value consensus between the parents, more anxiety, openness, and concern about emotional security. In other words, the parents' values differed, encouraging the children to establish their own values, and to develop creatively. These studies may be indicating that divided parental authority was experienced by the creative child and influenced the development of creativity by emphasizing individual divergence and expression of feeling. A possible conclusion here is that in order to avoid alienation from one parent the child makes independent decisions and thus becomes a creative thinker in the process. This conclusion, in the realm of aggression, was drawn also by Bandura, Ross, and Ross (1961).

Dauw (1966) and Watson (1957) found discipline in the home less strict for creative children of both sexes. And further, Watson (1957) found few (2/13) creative children in authoritative homes. He discovered (as did Domino, 1969)

that creative children were independent, co-operative, friendly, and showed initiative. Guilford (1965) found these characteristics also. However, in addition he found that the creative child could become estranged from peers and supervisors, such as parents.

Research by Frenkel-Brunswick (1949) indicated that children with a high tolerance for ambiguity (a characteristic of creativity, according to Holland and Astin, 1962) also had love and acceptance from others and a non-egodestructive discipline in the home. Ellinger (1964) found highly creative children experienced less coercive discipline, especially of a physical nature, than their less creative peers. The parents tended to be permissive.

Weisberg and Springer (1961) found that the 32 'gifted' fourth graders studied came from homes characterized by openness of expression and lack of domination by parents. Significant was the finding that these creative children were regarded as separate people rather than possessions, things, or extensions of the parent's identity. In this way autonomy, a criterion for creativity (Rogers, 1961), was fostered. Trowbridge and Charles (1966) found that highly creative students were consistently less conforming than the less creative students. Lack of conformity can sometimes be equated with rebellious behavior. That creative students were rebellious and angry towards their parents was the finding of several researchers (Barron, 1963; Bloom, 1963; Drevdahl, 1956; Knapp, 1963; Eisenman and Platt, 1970).

However, these results may have been due to greater freedom to express anger.

From an examination of the literature on factors found in the home fostering creativity, it appears that children from democratic homes and from homes where the parents differ in their level of dogmatism (values or belief system) will demonstrate more creativity than children from dogmatic homes. It also appears that either too great or too little parental control inhibits the expression of creativity in the child. Some firm, moderate level of limit setting is necessary (Coopersmith, 1967).

Arasteh and Arasteh (1968) summarize by saying: "Parents and the home atmosphere appear to be more instrumental in fostering or hindering the creative talents of children than are any other determinants." (p. 20)

F. Creativity in Relation to Sexual Roles.

Anderson and Cropley (1966) studied the effects of adult prohibition on the originality of children. They concluded that because daughters are subjected to more control, daughters tend to be less likely to commit crimes or to find other deviant expressions of their creativity than do sons. The control exerted upon daughters is reinforced by society's norms which stress that females cooperate rather than rebel. Daughters are taught to accept control, thus reducing any tendency to rebel. Torrance

(1963) believes that from an early point in their lives they learn to accept things as they are. Straus and Straus (1968) came to a similar conclusion in a comparative study of creativity of children in Bombay, India, and in Minneapolis, Minnesota, using 128 families. In both countries, daughters' scores were lower than sons' scores and the difference in the creativity scores between sons and daughters in Bombay was greater than they were in Minneapolis. It was noted that greater freedom and individuality was allowed daughters in the U.S.A.. This finding was supported also by Wilson (1958).

Helson (1968) has described the lack of creativity in daughters and women in several studies. However sho found some creative women who she studied. These women who were creative were students at a women's college and were found to identify more with their fathers, who were found to be intellectually oriented. Since Helson did not comment on non-creative women, it is possible that her conclusions may be made of all women regardless of their degree of creativity. That is, all women enrolled in post-secondary education may identify with their fathers providing their fathers were intellectual. Their mothers may be more interested in keeping the home and caring for the children than in intellectual pursuits. If so the fathers would be the models.

Torrance (1961) found little difference between the creativity of sons and daughters until they were five. From

then on the sons acquired superior abilities to manipulate and experiment, whereas the daughters excelled in fluency of response. Torrance (1967) also found that sons in early school years were superior to daughters in their ability to think independently, constructively, and creatively. By age 10 or 11, they began to lose this ability as they learn to conform to peer group pressure to maintain behavior norms. Daughters learned earlier than sons how to gain peer acceptance and thus to maintain norms of behavior. Highly creative sons tended to have more "silly or wild" ideas. They were found also to be less psychologically accessible and to have more internal tensions. Sons offered more ideas, though these were frequently noted by their teachers as disruptive in the classroom setting. Torrance and Dauw (1966) found no difference between male and female high school seniors on creativity, suggesting that the creativity scores between the sexes became equal by high school.

In an interesting study by Brooks (1975) over a 30 year period, artistic sons came from families where there was emotional tension and rejection of artistic expression from their fathers during the early years. This poses the question as to whether in some family environments the fostering of creativity is sex related, i.e. one type of environment fosters creativity in females and another in males.

This study will attempt to determine if sex related differences are present in levels of creativity.

G. Definition of Dogmatism.

Dogmatism is a measure of an individual's process of thinking, set of beliefs, and method of making decisions. It is also a description of a life style in which the source of authority is outside the self. It implies rigid and closed thinking, in which decisions are made by relying on formally learned solutions or cliches. Franklin and Carr (1971), and Rokeach (1960) stressed that highly opinionated persons were dogmatic while open-minded persons had greater ability to integrate new ideas (a criteria of creativity).

Dogmatic thinking appears to be the opposite of creative thinking (Grossman and Eisenman, 1971). Barron (1957) describes the uncreative personality as stereotyped, narrow in interest, unaware of social stimuli, submissive to authority, rigid, lacking insight, and suggestible. This description can be applied to the authoritarian personality outlined by Adorno, Frenkel-Brunswick, Levinson, and Sanford (1950) and Gowan, Demos and Torrance (1967). Jacoby (1967), Kirshna and Prasad (1971), and Larsen and Schwendiman (1969) all discuss studies which reveal that high authoritarian subjects are more insecure and have lower self-esteem than low authoritarian subjects. Vacchiano, et al (1968) in a study of 82 college students, using Rokeach's Dogmatism Scale, form E, concluded:

Subjects exhibiting dogmatism would seem to have a

> need to receive support, encouragement, and understanding from others; an intolerance for understanding the feelings and motives of others; and an avoidance in changing their environment or daily routines. (Vacchiano, et al, 1968, p. 84)

It appears that lack of a sense of security and a lowered self-esteem contributes to authoritarian thinking.

Maslow (1943) said that the authoritarian personality must be understood first in terms of his philosophy or 'world-view'. This view is of the world seen as a jungle, which is dangerous and threatening, in which human beings are perceived as evil, stupid or selfish. Since the law of the jungle is the survival of the fittest, safety comes from the power to dominate. The characteristics of this personality are: insecurity, classification of others in relation to self as superior or inferior, competitiveness, the judgement of others by externals such as titles, education, or job position, and a strong drive for power as a means to gratify needs for safety, belonging and love.

A finding by Adorno et al (1950) as revealed by Rokeach (1960) is the increased ability for the authoritarian person to exercise concrete thinking. Other characteristics of the authoritarian personality are limited perception, distorted memory, ambiguity, and intolerance. By contrast, Sawatzky (1968) discusses openness as being characterized by a person who rejects preconceived reality, recognizes each person as unique, presents an accepting attitude and projects realism with new people, problems, and situations.

Gowan et al (1967) state:

> The characteristics of the authoritarian personality are the antithesis of the creative attitude we seek. Creative behavior is characterized by variety and quality of perception. Whatever produces narrowness and rigidity becomes an important factor in limiting creativity. Attitudes that characterize authoritarianism seem representative of a range of social beliefs and predispositions that children develop, beliefs that influence their behavior and are related to the development of the creative attitude. (p. 130)

From these descriptions it may be hypothesized that authoritarianism, in its extreme form - dogmatism - discourages clear thinking and creative problem solving, while encouraging irrational thinking and conformity.

H. Effects of Dogmatic Parents on Child Development.

Coopersmith (1967) reports that one distinct characteristic of a family is the unequal distribution of power. This is demonstrated by material resources, knowledge, experience and skills possessed to a greater degree by the parents than by their children. The child is faced with the reality that to a large extent his physical, emotional, and social survival and well-being are dependent upon the older and more powerful members of his family. The parents exert controls upon the child in order to socialize the child's behavior. As the child becomes older more power and responsibility is assumed which reduces the gap between the parents and the child.

Sanford (1956) found that identity with the same sex parent is stronger in dogmatic than in permissive families. Dogmatic parents maintain role definitions and punish severely for non-conformity. This agrees with the conclusions reported by Domino (1969) of highly creative sons. Bandura, et al (1961) found significant same sex modeling of aggression. Youths who were extremely conforming described their parents in highly idealized terms with no evidence of criticism while the more independent youths gave a more balanced picture of praise and criticism.

Hare (1962, in Dinkmeyer, 1971) showed that the authoritarian group will produce a greater quantity of a product while the democratic group produces a higher quality product. This could be interpreted to mean that the authoritarian family produces more concrete thinking, while the democratic family promotes creativity, where creativity is assumed to be a dimension of quality. In comparison, Elder and Bauerman (1963) found that the larger the family size the greater the degree of authoritarianism would be found. The authoritarian group gets a task completed more quickly. Where speed is the priority value, one can expect the authoritarian approach to be used.

Erick Fromm (1941) has been concerned with the effects of authoritarian parenting. He believes that authoritarian procedures instill a desire to live within secure and comfortable limits, depress risk taking and curiosity, and diminish the desire for freedom and love. Similarly,

Siegelman (1966) noticed that males who saw their parents as punitive were themselves seen as withdrawn by their peers.

Authoritarian parents do not typically use an individualized approach with their children. They are mainly concerned with the transmission of a set of fixed rules and customs. Therefore the development of a clearly defined personal identity and personality integration in the child may be adversely affected.

McCord et al (1961) found aggressive sons had overcontrolling mothers. Less aggressive though assertive sons had normally controlling mothers. Delinquent sons had either over or under controlling mothers. There was greater consistency in discipline by mothers of nonaggressive sons than by mothers of aggressive sons. Consistent, moderately controlling discipline would seem to be the most effective in controlling aggressive behavior and reinforcing normal assertive behavior. Overcontrolling behavior is considered here to be a demonstration of dogmatic thinking, as overcontrolling behavior is rigid, narrow minded and certainly highly opinionated.

Becker (1963) surveyed a variety of research on the consequences of different kinds of parental discipline. He discriminated among a variety of factors such as the age at which discipline was given, the person who administered it, and how it was administered. He found that a restrictive attitude by the mother produced different results depending on the age of the child. For instance, if the restriction

was applied before age three, conforming, dependent behavior resulted. However, when applied later, an inhibited form of aggressive reaction resulted. Daughters gave less criticism of their mothers while sons showed a similar attitude towards their fathers, when the parent had been restrictive. This is in agreement with with Bandura et al (1961).

Submissive, dependent, apathetic children were the product of domineering parents, according to Coopersmith (1967). Their reaction towards peers varied from the extremes of shyness and withdrawal to active belligerance and lack of consideration of others. Coopersmith (1967) found that reasonable, but high limit setting enhanced self-esteem and thus the creativeness of children by allowing them freedom within the limits. The youth, presumably, felt safe knowing the limits and thus could express himself creatively within them. However, Nichols' (1964) study of mothers of over 1000 "talented" high school seniors concluded that:

> The finding that the children of authoritarian mothers obtained better grades in school and more favorable ratings by their teachers is not inconsistant with the hypothesis that authoritarian childrearing practices lead to conformity and 'good' behavior but stifles originality. (Nichols, 1964, p. 1047)

Dogmatic thinking is not necessarily reasonable. Little reasoning goes into using cliches for problem solving. For example, teaching that "children should be seen and not heard" might solve the problem of loud, energetic children when adults want to relax. On the other hand the approach

might not be as honest as that of the parent who yells " I can not stand this noise. Go play elsewhere." A child in a highly dogmatic family is likely to be reinforced for accepting ready-made answers and not for seeking out original solutions to problems. This is the sort of parenting deMause (1974) describes as occuring long in the history of childhood. However, there is some contradiction in results in the literature review so that it is uncertain what the relationship may be of pairs of parents with differing levels of dogmatism to their children's creativity (McCord, McCord and Howard, 1961). There may be some other factors affecting these variables.

It is expected in this study that highly dogmatic parents will have low creative children. Sons will be low creative when their fathers are highly dogmatic and daughters will be low creative when mothers are highly dogmatic. There was no literature found to predict whether age is a factor in dogmatic thinking.

I. Definition of Irrational Thinking.

Ellis operationally defines irrational thinking in his list of eleven irrational ideas (see Appendix A). The traits of the irrational thinker, as described by Ellis (1962), are inhibition, hostility, defensiveness, guilt, anxiety, inefficiency, inertia, uncontrolled behavior, and/or feelings of unhappiness. Many of these qualities are also

characteristic of the dogmatic person. Fox (1969) demonstrated that persons described as dogmatic, closed minded and critical in thinking were in fact higher in irrational thinking but did not measure high in dogmatism. It may be that many persons seen as dogmatic are in fact not dogmatic but are displaying behavior of irrational thinking.

The irrational thinker is driven by fear that "something catastrophic will happen if... " One irrational thought is tc never make mistakes (combination of Irrational Ideas #2, #4, and #11, Appendix A.). The North American culture is inclined towards perfection and purity (Irrational Idea #11, Appendix A). However, people learn by their mistakes and at times this may be the only learning method available. By contrast, the fear of making mistakes creates inertia in some people. This fear can lead to rigidity, withdrawal, and an inability to cope with decision making responsibilities. A closed system may develop, which rejects change, ignores information and insists on one traditional way for doing things (believed to be correct).

Change is inherent in problem solving. When an individual resists change, the range of possible solutions to a problem will be limited. Problem solving relates to an open system where permission to make mistakes is necessary. Resistence to change reinforces conformity.

Albert Ellis (1962) pointedly refers to parents and social agencies (churches, schools and governmental institutions) as contributing to irrational thinking by

reinforcing traditional, conforming behavior and beliefs. It is the exceptional individual who escapes it altogether. According to Ellis (1962) this thinking develops neuroses. The degree to which these ideas are held by an individual discriminates between the mentally disturbed person and those mentally healthy persons who can cope with problem situations (Davies, 1970).

Ellis (1962) believes that human emotion is primarily the result of thought; that is negative feelings will result from irrational thinking. Biases, judgements, and prejudices are the product of narrow controlled thinking. Assuming this is true, then the dogmatic person whose feelings are predominantly negative (Adorno et al, 1950; Fromm, 1941; Maslow, 1943) is basically irrational in thinking. Irrational thinking, as well as dogmatic thinking, is described as automatic, conditioned, and unaware thinking.

The variables: irrational thinking and dogmatism appear to be related by definition, yet in a study by Fox (1969), in reality they were unrelated.

J. Sexual Role Differences in Irrational Thinking

Davies (1970) compared men and women in the general population on the AII and found a significant difference ($p = .0006$), with women scoring significantly higher than men. It is expected that daughters will also be more irrational than sons in this study.

K. Irrationality, Creativity, Dogmatism, and Conformity.

Conformity does not appear to be compatible with creativity. This premise is also held by Moustakas (1977) as when he wrote:

> To the degree that the individual strives to attain similarity or congruity, to the degree that actions are geared toward being popular or victorious or approved of, to the degree that individuals model themselves after others, they fail to grow as selves, fail to develop unique identities, fail to grow as creative beings with desires and capacities, with lives that are genuinely related to others. (1977, p. 34)

Hacker (1965) and Moustakas (1967) in their discussions of creativity and conformity regard conformist behavior to be destructive to creativity. Conformist behavior appears to limit free-association which is essential in creative thinking. And according to Arasteh and Arasteh (1968), in citing work by Anderson and Anderson (1965):

> Authoritarianism, including conformity, is considered...to be the crucial factor in limiting creativity. Children from strongly authoritarian cultures (e.g. Germany and Mexico) ...revealed greater defense mechanisms of deception, escape from reality, submission, aggression, and punitive action. (p. 26)

In Nichols and Holland's (1963) study, parents' desire for conformity (happy and well adjusted, dependable and reliable, curious, good student, and self-controlled) in their children is generally negatively related to their children's achievement, while the parents' desire for their children to be independent and ambitious is positively related to their children's achievement. Authoritarian

attitudes are negatively related to artistic achievement while laissez-faire attitudes are positively related to artistic achievement. Parental (especially fathers) preferences for realistic, conventional, and social occupations are negatively related to artistic achievement. An interesting finding is that the father's variables are more highly related to achievement than the mother's variables. This study points up again the modeling effect parents have on their children.

Hart and Brown (1967), in referring to criteria for teacher selection, states that teachers who reinforce rational rather than conforming thought are necessary. This may be presupposing a positive relationship between conformity and irrational thinking. Although conformity is not generally discussed by Ellis in his explanation of irrational thinking, an informal perusal of his irrational thinking categories suggests that these ideas are largely cliches accepted because of the person's need to conform to society's norms. Any of the eleven irrational ideas, if believed, could be considered by the believer as commonly held beliefs.

Irrational Ideas #1, #3, #8, and #10 (Appendix A) lend themselves most obviously to conformity. To be loved by all people one would have to conform to each person met, and society's penal code supports the idea of severely punishing 'evil doers'. This suggests a positive relationship between irrational thinking and conformity. It is expected that

irrational thinking will be negatively related to creativity.

L. Irrationality, Creativity, Dogmatism, and Age

There have been few longitudinal studies reflecting the relationship age has with any of these variables. Torrance (1961) did some work with creativity and found girls' creativity reduced as soon as they entered school due to peer group pressure to conform, while this change did not occur in boys until approximately 10 or 11 years of age. Though there is no attempt here to do a longitudinal study, the three age groups will be compared on the variables of irrational thinking and creativity to determine what the age related conclusions will be. Should a significant result be revealed an attempt will be made to determine if the result is related to the dogmatism or irrational thinking group to which the parents belong.

M. Hypotheses

The preceding survey of research literature suggests the following hypotheses.

1. Dogmatism (as measured by the Dogmatism Scale, form E) of the parents will be negatively related to the creativity (as measured by Torrance's Test of Creative Thinking) of their children.
2. Dogmatism (as measured by the Dogmatism Scale, form E) of the parents will be positively related to the irrational thinking (as measured by the Irrational Ideas Inventory) of their children.
3. Irrational thinking (as measured by the Adult Irrational Ideas Inventory) of the parents will be negatively related to the creativity (as measured by the Torrance Test of Creative Thinking) of their children.
4. Irrational thinking (as measure by the Adult Irrational Ideas Inventory) of the parents will be positively related to the irrational thinking (as measured by the Irrational Ideas Inventory) of their children.
5. Sex variable:
   a. The extent of the relationships described in hypotheses 1, 2, 3, and 4 (between the variables of dogmatism and irrational thinking of parents and creativity and irrational thinking of children) will

differ for sons and daughters, and

b. Daughters will differ from sons in their creative and irrational thinking.

6. Age variable:

a. The extent of the relationships described in hypotheses 1, 2, 3, and 4 (between the variables of dogmatism and irrational thinking of parents and creativity and irrational thinking of children) will differ depending on the age-range of the children.

b. Creative and irrational thinking will vary with the age-range of the children.

III. EXPERIMENTAL DESIGN

A. Sample.

This study was conducted in Edmonton, which is the capital of Alberta, Canada, and has a population of about 500,000. Edmonton supports two educational systems: the Edmonton Public School Board (EPSB) and the smaller Separate School Board. Due to the limitation of time, the sample population of this study was selected from the EPSB only. EPSB has approximately 70,000 enrolled children from various economic, religious, social, racial, and intellectual backgrounds.

The first phase of the sampling process entailed the random selection of 600 names of students between the ages of 11 and 16 enrolled in the EPSB. From the 600 sample names, a total of 100 names of cooperating English speaking, two parent families were needed in order to satisfy the projected statistical requirements of this study. All single parent families were eliminated because the study is concerned with the interaction of both parents with their child. Non-English speaking families were eliminated also since the instruments and instructions were in English only. Families with a step-parent were included if the relationship had existed for at least the previous five years.

Severely mentally or physically handicapped persons were excluded from the list. Some families on the list had moved or had no listed telephone, and others declined to co-operate, so that approximately one-sixth of the original families listed were accepted and agreed to the testing. No further contacts were made after 100 families had been tested.

Children between the ages of 11 and 16 were chosen for the study. It is within this growth period that feelings are typically tumultuous and the effects of a particularly dogmatic or irrational home environment might be most pronounced. Children in this age range are becoming verbally fluent and test-wise. At the same time they are young enough to be heavily influenced by their home environment. They have not yet matured to the point that an independent life style is possible.

B. Sampling Bias.

One bias of the study was that only telephone subscribers were contacted. As this population represents about 90% of the total population this bias was not considered significant. An associated bias was that persons with unlisted numbers were not contacted. Though these people might conceivably represent a dogmatic group, as they were determined enough to make the decision and then go to the time and expense to have an unlisted number, only a very

few families fell into this category.

Another bias was that only volunteering families were used. Persons who were subject to test anxiety and were highly threatened, might be expected to refuse to cooperate. This may have tended to eliminate dogmatic people, assuming that dogmatic people have these qualities. In addition, the study may have posed a threat for families faced with the possibility of marriage breakdown.

A few willing families were not used when it was impossible to set a compatible time for all family members to meet.

C. Test Instruments.

Four instruments were used. These were divided into two test batteries: Adult and Youth.

ADULT TEST BATTERY

I. Rokeach's Dogmatism Scale, form E has 40 items. It was developed in 1960 to measure general authoritarianism, or dogmatism, and intolerance (see Appendix D). It is a test of both conservative and radical dogmatism, as in right wing and left wing politics.

Scoring is on a six point Likert scale from 3 to -3, eliminating zero in order to force a response. The positive scores indicate agreement and the negative scores indicate

disagreement. A constant four is added to each score to eliminate negative numbers before totalling. The higher the total score, the greater the degree of dogmatism.

Validation and norming.

Rokeach normed and validated this test by using professors and student peers who nominated names of "open and closed" students. These students took the form E, the California F scale, and the California Ethnocentrism scale (Rokeach, 1960). The high dogmatic or "closed system" subjects scored significantly higher than the low dogmatic or "open system" subjects. Rokeach carried out further norming with a Roman Catholic and a labour union sample in Britain. Lemire (1972) normed it on Edmonton School teachers.

Reliability.

Reliability is reported as .68 to .93 (odd-even, corrected by Spearman-Brown formula, Rokeach, 1960). Ehrlich (1961) reports a split-half reliability of .75 and a five to six month test-retest reliability of .73. Sawatzky (1968) reported a test-retest reliability of .83 over a 3 month period with 20 subjects, in Edmonton, Alberta. These coefficients suggest a reasonably reliable instrument.

II. Adult Irrational Ideas Inventory (AII), a 60 item test was developed by Davies, (1970) based on the original inventory designed by Zingle (1965). The test is designed to measure the degree of irrational thinking of adults.

Scoring is on a five point Likert scale ranging from the greatest degree of agreement which is the greatest

degree of irrationality (scored 5), to the least agreement which is the least degree of irrationality (scored 1). Eight of the items are scored in reverse, that is the greatest degree of agreement is the least degree of irrationality and is scored 1, while the least agreement is the greatest degree of irrationality and is scored 5. This reversal of scoring is a check for honesty and response bias. An overall high score indicates a higher degree of irrational thinking than subjects with a low score.

Validation and norming.

Content validity was established by Davies (1970) based on the content validity of the original II Inventory developed by Zingle and on specialist judge rating and scrutiny by Dr. Ellis. Construct validity was derived by Davies by demonstrating internal consistency and by administering both the II and the AII to 51 high school students establishing a correlation of .70. This construct validity has been established also by Conklin (1965), Zingle (1965), and Taft (1968). Davies normed the original 99 item test on 123 subjects ranging in age from 13 years to 75 years. These subjects, of which 66 were female and 57 male, represented a wide range of occupations. Correlations were made between the total responses for each item and the total scores on the inventory to arrive at a 60 item test whose items had an item-total correlation of .18 or better (significance at 5%).

Reliability.

A test-retest reliability on 110 fourth year university education students over a three week period revealed a Pearson r of .77. The Kuder-Richardson formula revealed coefficients of .74 and .78. These indicate acceptable reliability over the three week period.

YOUTH TEST BATTERY

I. Torrance Test of Creative Thinking, figural form B (TTCT, also known as the Minnesota Test of Creative Thinking, MTCT) was chosen to measure divergent thinking in the four dimensions of fluency, flexibility, originality, and elaboration. Fluency is the steady flow of ideas, conceptualized in terms of units, relations and systems. Flexibility is the readiness to change the direction or category of thinking, as in a complete thought change. Originality is the readiness to modify information. Elaboration is the filling out of ideas with details. Figural Form B was chosen as it required fewer verbal skills and involved fine motor skills primarily. The age range of the sample was expected to have well developed fine motor skills. It was thought that this form would bias the sample less than the verbal forms would. The test has three timed items, each instructing the subject to

> ...think of the most interesting and unusual ideas you can - ideas that no one else...will think of. After you think of an idea keep adding to it and build it up so that it will tell the most interesting and exciting story possible. (Torrance, 1966, p. 7)

Item one (Picture Construction) is scored for originality and elaboration. Item two (Picture Completion) and item three (Circles) are scored for fluency, flexibility, originality and elaboration.

> Scoring is accomplished on a scale ranging from zero to five according to frequency of occurrence in the 500 records analyzed. Responses occurring on five percent or more of the records receive no credit. (Torrance, 1966, p. 14)

This method of scoring gives the originality score. Fluency is the number of responses less the duplications and irrelevant responses. Flexibility is the total number of different categories of drawings, and elaboration is the total number of extra details of each picture. The higher the score the higher the degree of creativity.

Validity.

Construct validity was established by comparing the scores with other creativity test scores with the results being .41 to .51. The inter-test validity scores are: fluency with flexibility: .77; fluency with originality: .68; and flexibility with originality: .66.

Reliability.

Reliability was found to be above .90 for the person scoring the test. That is, the scorers agreed with each other on their scoring, 90% of the time. Test-retest reliability over

a variety of periods from one week to one school year was .71 to .93 and .34 to .79. Over a three year period the test-retest reliability was .35 to .73. Alternate forms reliability was .70 to .80. Since there are many variables that affect reliability over time (see Boersma and O'Bryan, 1968), the correlations of .35 to .73 would seem to be reliable.

II. Irrational Ideas Inventory (II) was developed by Zingle (1965) with 122 items and was revised by Allen (1970) to a 65 item instrument. Allen (1970) analyzed responses from a sample of 900 subjects from grade seven through twelve. The mean score was 201.42 and a standard deviation of 22.28. The 65 item instrument was selected for this study.

Subject response is recorded on a five point Likert scale in the same way as the Adult Irrational Ideas Inventory.

Validity.

Content validity, as measured by Taft (1968), was reported as .75 to .85. Judges were used to match proposed test items with the corresponding irrational belief selected from Ellis' list of eleven irrational beliefs (see Appendix A).

Reliability.

McPhail (1969) normed the test on 90 grade eleven students with a test-retest reliability of .71 over seven days.

The validity and reliability estimates of the II indicates that the test is a relatively adequate measure of

irrational thinking.

D. Administrative Procedures.

It was decided to interview the entire family at one time and in the family's home if circumstances permitted. It was expected that this approach would avoid any change in typical thinking patterns which might occur with a strange or unfamiliar environment. However, during the last three months of the data collection period, a few family members were tested individually in order to conclude the data collection more rapidly. In such instances commitment was obtained from family members initially taking the test to avoid discussing the tests in the presence of others in the family who would be tested later.

A letter introducing the study was sent to the 600 names on the random sample list (Appendix B). Each family then was contacted by telephone. Further details of the study were explained and questions answered. An interview date, time, and place was established. Then the family, composed of two parents and at least one child between the ages of 11 and 16, were interviewed.

E. Recruitment, Selection, and Training.

Interviewers.

The Interviewers were recruited from two sources. First, undergraduate first year education students enrolled in a child development seminar conducted by this author provided most of the Interviewers. Second, students were recruited through the Student Employment office of the University of Alberta. These students were from any faculty and year. Final selection of the Interviewers was based on:

1. demonstrated responsibility and conscientiousness by their promptness and attention to detail;
2. a clear, distinct and fluent verbal ability;
3. adequate time available to fulfill the assignment;
4. an interest in collecting the data; and
5. a car available for transportation to and from the homes of the participating families.

The training involved 3 1/2 hours of instruction time over a two day period. All training materials are included in Appendix C. At the first meeting, or phase one, lasting two hours, the trainees were given all the study materials to review. They were made familiar with a prepared telephone speech to be given to each of the participating families.

Then the two test batteries were administered to the trainees. Taking the tests gave the trainees a first hand knowledge of the tests. The tests were constantly referred to as questionnaires. In this way the author was assured that the Interviewers also would be consistent in referring to the test booklets as questionnaires, effecting a reduction in test anxiety in the participants. The trainees were told to become familiar with the prepared telephone speech, to practise it, and to return on a specific later date for further training.

Phase two lasted 1 1/2 hours and consisted of practising the telephone speech and potential inquiries and situations generated by the families to be contacted. Questions were answered and the interviewer packet was distributed (Appendix C).

The Interviewers were informed only of the general nature of the study. They were told the study was designed to discover how average families function and how their ideas and values affect their children's creativity. Since this was also the information given to the family, the Interviewer did not have information which could not be shared. The Interviewers were instructed to remain neutral in their approach to the family to reduce the Interviewer's influence on family responses. They were also to discourage the parents from viewing their children's work without the child's unpressured permission. Each family was offered a summary of the total results, to be mailed to them once the

study was completed.

Scorers.

Scorers were also recruited, trained and selected. The training consisted of two periods; each was four hours in length. The Scorers were shown how to score the tests, then were observed and guided through scoring sample tests until they felt confident and demonstrated competence to score without supervision. Once the Scorers reached the criterion of correctly scoring two of the Interviewer's questionnaires, they were given a packet containing the data from four or five families. When each packet was finished it was collected and a new packet was given to them. Occasional spot checks were made with no errors discovered.

IV. RESULTS

A. Overview and Statistical Description of the Sample

In order to test the hypotheses stated in chapter II of this study the test scores of 100 pairs of parents were categorized according to the group means on the tests for dogmatism and irrational thinking. The group mean was calculated separately for mothers and fathers. Marital pairs were then divided into one of the following four sub-groups:

1. Both parents scored above the group mean (HH),
2. Both parents scored below the group mean (LL),
3. The father scored above his group mean while the mother scored below her group mean (HL),
4. The father scored below his group mean while the mother scored above her group mean (LH).

Following is a table describing the means of the parent groups.

Table 1. Mothers' and fathers' group means on dogmatic and irrational thinking.

	DOGMATISM			IRRATIONAL THINKING		
	mean	s.d.	range	mean	s.d.	range
Fathers	143.39	31.71	75-218	152.27	19.76	100-212
Mothers	147.94	28.59	90-236	163.14	21.06	104-203

The differences between the fathers' and mothers' scores were not significant for either dogmatism or irrational thinking.

A Pearson correlation between the parents' variables revealed a correlation of r = .38 exists between the Dogmatism scale and the Adult Irrational Ideas Inventory. This suggests there is a tendency for parents who score high on dogmatism to score high on irrational ideas, and for those who are less dogmatic to have fewer irrational ideas.

The children were similarily divided. Three age groups were formed: 11 and 12 year olds, 13 and 14 year olds, and 15 and 16 year olds. In addition, two sex groups were formed, sons and daughters.

Table 2 describes the youth sample.

Table 2. Youth's sample sizes.

	Sex Groups		Age Groups		
	Male	Female	11-12	13-14	15-16
Sample sizes	86	81	55	61	51

A correlation of the children's creativity scores and the children's irrational thinking scores yielded .17 with a probability of .03 that the relationship between these measures is due to error or chance.

Two-way analysis of variance tests were carried out to permit the examination of the following list of variables: (dependent variable/ independent variables)

1. Children's creativity/ child's age by parents' dogmatism,
2. Children's creativity/ child's sex by parents' dogmatism,
3. Children's creativity/ child's age by parents' irrational thinking,
4. Children's creativity/ child's sex by parents' irrational thinking,
5. Children's irrational thinking/ child's age by parents' dogmatism,
6. Children's irrational thinking/ child's sex by parents' dogmatism,
7. Children's irrational thinking/ child's age by parents' irrational thinking,
8. Children's irrational thinking/ child's sex by parents' irrational thinking.

Significance was set at the 5% level of confidence to establish support for each of the research hypotheses.

A Scheffé multiple comparison test was used on each of the analysis of variance tests where a significant difference existed. It allowed for analysis by unequal sample size and for some variance in the homogeneity of variance. Due to the fact that this test is so rigorous, significance was set at the 10% level of confidence whenever the Scheffé test was applied.

Sample sizes and group means for each of the eight two-way analysis of variance tests are given in Table 4 and

5 (Appendix F) respectively.

B. Results of Analysis

The eight two-way analysis of variance tests (ANOVA) are discussed here in the order of the hypotheses listed in Chapter II.

Test 1.

Test 1, the results of which are shown in Table 3, is a two-way analysis of variance of children's creativity scores for the three age groups with the four parent dogmatism groups.

Table 3. ANOVA of children's creativity scores by age group with parents' dogmatism group.

Variation	Sum of Squares	Degrees of Freedom	Mean Squared	F	P	Sig
Children's Age	4737.92	2	2368.96	1.19	0.31	NS
Dogmatism Groups	13494.51	3	4498.17	2.25	0.08	NS
Interaction Effect	5205.48	6	867.58	0.44	0.85	NS
Errors	308522.00	155	1990.46			
Total		166				

The results of the analysis of variance indicate that there is no significant difference in the children's

creativity scores attributable to age group. There is no significant difference between the children's creativity scores that can be attributed to the parent's dogmatism sub-group. There is a tendency approaching significance (p= .08) that a difference exists between the parents' groups. This tendency is revealed in the Scheffé test (Appendix F, Table 6) where the parent sub-group with both parents low (LL) in dogmatism have more creative children than the sub-group where the father is high and the mother is low (HL) (p = .16).

The relationship between the children's creativity score and the parent's dogmatism sub-group is not related to the age level of the child. It is interesting to note however, that there is a trend for the LL dogmatism group to have the most creative children, and the HH dogmatism group to have the second most creative children which holds for the two oldest of the three age groups (Appendix F, Table 5). The 11 to 12 year old group demonstrate the most creativity when both parents are less dogmatic (LL). The second most creative group in this age range is HL in which the parents differ in level of dogmatism.

Test 2.

Table 7 is the two-way analysis of variance (ANOVA) of the youth's creativity scores for the two sex groups with the four parent dogmatism sub-groups.

Table 7 ANOVA of children's creativity scores by sex group with parents' dogmatism group.

Variation	Sum of Squares	Degrees of Freedom	Mean Squared	F	P	Sig
Sons vs. Daughters	1503.35	1	1503.35	0.76	0.39	NS
Dogmatism Groups	14751.86	3	4917.29	2.47	0.06	NS
Interaction Effect	2468.07	3	822.69	0.41	0.74	NS
Errors	316578.00	159				
Total		166				

The analysis of variance reveals no significant difference between the creativity scores of sons and daughters. However, as is found in Test 1, there is a tendency ($p = .06$) for the youth's creativity scores to differ depending on the dogmatism sub-group to which their parents belong (Appendix F, Table 8). Again, the difference exists between the HL and LL parent groups, as the same sample is tested on the same variables as in Test 1. The interaction effect is not significant, indicating that the relationship between the youths' creativity and the parents' dogmatism does not differ for sons and daughters.

Test 3.

Table 9 reveals the results of the two-way analysis of variance of children's irrational ideas scores for three age groups with four parent dogmatism groups.

Table 9 ANOVA of children's irrational thinking scores by age group with parents' dogmatism.

Variation	Sum of Squares	Degrees of Freedom	Mean Squared	F	P	Sig
Children's Age	4843.19	2	2421.60	7.14	0.001	*
Dogmatism Groups	604.77	3	201.59	0.59	0.62	NS
Interaction Effect	1162.27	6	198.71	0.57	0.75	NS
Errors	2571.00	155	339.17			
Total		166				

There is a significant difference between the irrational thinking scores of the children's age groups. The 11 and 12 year old youths score significantly higher than both the 13 and 14 year old youths ($p = .02$) and the 15 and 16 year old youths ($p = .002$). This is documented in Table 10.

Table 10. Probability Matrix for Scheffé Multiple Comparison of Children's Irrational Thinking Scores by Age with Parents' Dogmatism Group.

Group		11 and 12	13 and 14	15 and 16
11 and 12	F		4.06	6.37
	P	1.00	0.02*	0.002*
13 and 14	F			0.36
	P		1.00	0.70
15 and 16	F			
	P			1.00

* denotes a statistically significant result.

That is, youths within the youngest age range are significantly more irrational than the oldest youths.

There are no significant differences in the irrational thinking scores of the youths depending on the parents' dogmatism sub-group scores ($p = .6$). A thorough inspection of the data shows that dogmatic parents tend to have more irrational children. This tendency is not significant.

The interaction effect is not significant ($p = .8$), showing that parental dogmatism is not a significant factor in the age-related differences found in the youths' irrational thinking scores.

Test 4.

Table 11 is the two-way analysis of variance of the irrational thinking of the youths for the two sex groups with the four parent dogmatism sub-groups.

Table 11 ANOVA of children's irrational thinking scores by sex group with parents' dogmatism group.

Variation	Sum of Squares	Degrees of Freedom	Mean Squared	F	P	Sig
Sons vs. Daughters	1225.43	1	1225.44	3.46	0.06	NS
Dogmatism Groups	348.65	3	116.22	0.33	0.81	NS
Interaction Effect	1789.86	3	596.62	1.69	0.17	NS
Errors	56245.00	159	353.74			
Total		166				

The analysis of variance reveals no significant differences between the sons' and daughters' irrational thinking scores depending on the parents' dogmatism sub-group. However, there is a tendency approaching significance ($p = .06$) for the daughters to differ from the sons on irrational thinking. This can not be accounted for by variations in parental dogmatism scores. The relationship between the youths' irrational thinking score and the parents' sub-group on dogmatism is not related to sex.

Test 5.

Table 12 gives the two-way analysis of variance of the youth's creativity scores for the three age groups with the four parent AII sub-groups. Valid statistical analysis was questionable due to the small sample size (Appendix F, Table 4)

Table 12. ANOVA of children's creativity scores by age group with parents' irrational thinking group (AII).

Variation	Sum of Squares	Degrees of Freedom	Mean Squared	F	P	Sig
Age Groups	5717.59	2	2858.79	1.39	0.25	NS
AII	3582.70	3	1194.23	0.58	0.63	NS
Interaction Effect	3289.47	6	548.24	0.27	0.95	NS
Errors	320050.00	155	2064.84			
Total		166				

The analysis of variance reveals no significant results between the youths' creativity scores depending on either the age group to which the youths belong, or the AII sub-group to which their parents belong. The interaction effect also is not significant, indicating that the children's creativity scores are not affected either by the ages of the children or by the parents' AII sub group.

Test 6.

Table 13 reveals the results of the two-way analysis of variance of the youth's creativity scores for the two sex groups with the four parent AII sub-groups.

Table 13. ANOVA of children's creativity scores by sex group with parents' irrational thinking group (AII).

Variation	Sum of Squares	Degrees of Freedom	Mean Squared	F	P	Sig
Sons vs. Daughters	1426.39	1	1426.39	0.70	0.40	NS
AII	1645.87	3	548.62	0.27	0.85	NS
Interaction Effect	6562.65	3	2187.55	1.07	0.36	NS
Error	324026.00	159	2037.90			
Total		166				

This test does not reveal a significant difference between the creativity of the sons and daughters, nor is there a significant difference between the parents' AII sub-groups. There are no sex-based differences in the children's creativity scores, nor are the scores affected by the AII sub-group of the parents.

Test 7.

Table 14 shows the two-way analysis of variance of the youth's irrational thinking scores for the three age groups

with the four parent AII sub-groups.

Table 14. ANOVA of children's irrational thinking scores by age group with parents' irrational thinking group (AII).

Variation	Sum of Squares	Degrees of Freedom	Mean Squared	F	P	Sig
Age Groups	4404.00	2	2202.00	6.83	0.001	*
AII	2928.22	3	976.07	3.03	0.03	*
Interaction Effect	1781.62	6	296.94	0.92	0.48	NS
Errors	49924.00	155	322.09			
Total		166				

The sample size of the LH parent sub-group is again too small for results to be relevant in this particular group. There is a significant difference between the irrational thinking scores of the different age groups ($p = .001$). These results are similar to whose found between the children's age groups in Test 3. The Scheffé test (Table 15) reveals that the difference exists between the 11 and 12 year old children and the 13 and 14 year old children, and between the 11 and 12 year old children and the 15 and 16 year old children.

Table 15. Probability Matrix of Scheffé Multiple Comparison of Children's Irrational Thinking Scores by Age Group with Parents' Irrational Thinking Group (AII).

Group		11 and 12	13 and 14	15 and 16
11 and 12	F		4.26	5.75
	p	1.00	0.02*	0.004*
13 and 14	F			0.36
	p		1.00	0.70
15 and 16	F			
	p			1.00

* denotes a statistically significant result.

There is a significant difference in the children's irrational thinking scores depending on their parents' AII sub-group ($p = .03$) as well. The Scheffé test (Table 16) reveals that the parents who are both high (HH) on AII have children whose irrational thinking is significantly higher than do those parents who are both low (LL) on AII ($p = .06$).

Table 16. Probability Matrix of Scheffé Multiple Comparison of Parents' Irrational Thinking Group Using Children's Irrational Thinking Scores by Age Group.

Group		HH	LL	HL	LH
HH	F		2.58	1.93	0.69
	P	1.00	0.06*	0.13t	0.56
LL	F			0.002	0.13
	P		1.00	1.00	0.94
HL	F				0.09
	P			1.00	0.96
LH	F				
	P				1.00

* denotes a statistically significant result.

There is also a trend (p = .13) for the youth's with both parents high (HH) in irrational thinking to be more irrational than youths with their fathers high and their mothers low (HL). Between the age groups of the children and the AII sub-group of the parents no significant interrelationship is present which would affect the children's irrational thinking scores.

Test 8.

Table 17 gives the results of the two-way analysis of variance of irrational thinking scores of the youth's sex groups divided into four parent AII sub-groups.

Table 17. ANOVA of children's irrational thinking scores by sex groups with parents' irrational thinking groups (AII).

Variation	Sum of Squares	Degrees of Freedom	Mean Squared	F	P	Sig
Sons vs. Daughters	1521.13	1	1521.13	4.33	0.04	*
AII	2553.21	3	851.07	2.43	0.07	NS
Interaction Effect	166.07	3	55.36	0.16	0.93	NS
Errors	55808.00	159	350.99			
Total		166				

This analysis reveals a significant difference between the sons' and daughters' irrational thinking groups, with daughters being more irrational than sons. Table 18 (Appendix F) describes the results of the Scheffé test of significance. No significant difference is revealed in the children's irrational thinking scores dependant on which group the parents are in. However, similar to results in Test 7, two tendencies approaching significance are revealed for a difference to exist between the parent groups. There is a trend for the HH group tends to differ from the LL group ($p = .17$) and the HL group ($p = .13$). Sex-based differences in children's irrational thinking scores show no

significant relationship with parents' AII sub-groups.

C. Summary of Results.

1. Younger youths are significantly more irrational than older youths.
2. Parents who are both highly irrational in their thinking have children whose irrational thinking is high.
3. Children whose parents are both highly irrational are more irrational than children in any other group.
4. Daughters are more irrational than sons in their thinking.
5. There are no significant relationships at the 5% level of significance between parents' dogmatism and children's irrational thinking in any age or sex group.
6. There are no significant relationships at the 5% level of significance between parents' dogmatism and children's creativity in any age or sex group.
7. A tendency approaching significance at the 10% level of signifiance, exists for low dogmatic parents to have children who are more creative.
8. No significant relationships at the 5% level of significance were found between the parents' irrationality and the children's creativity.

9. No relationship emerged between the sex groups or the age groups on the creativity variable.
10. No statistically significant interaction effects are present on any one of the eight tests.

V. DISCUSSION AND IMPLICATIONS

The discussion follows the order of the hypotheses. The implications of this study follows.

A. Hypotheses

Hypothesis One

Dogmatism of the parents will be negatively related to the creativity of their children.

Tests 1 (ANOVA of youths' creativity, age, and parents' dogmatism) and 2 (ANOVA of youths' creativity, sex, and parents' dogmatism) examined this hypothesis and did not statistically support the hypothesis. A pattern did emerge for both parents who are low in dogmatism to have more creative children than parents who differ in dogmatism, with the father being more dogmatic than the mother. This pattern is suggested in the results of both Tests 1 and 2.

In the less dogmatic environment, an individual with strong creative tendencies will find fewer restrictive behaviors demanded of him which would impede creative expression. The parents may exercise limitations in other ways, however the creative youth will not be hampered by the repetitive illogic of dogmatism found in highly dogmatic parents. The literature review indicates that a significant relationship between the two variables: creativity and

dogmatism, should exist. The Literature has suggested that the dictatorial and controlling behavior of the parents would limit the free associating thought processes of their children and thus would be expected to decrease the creativity of the product, as in H.H. Anderson (1959) Nichols (1964), and Rogers (1961).

It is believed that the nature of the continuous population sample is the reason for the absence of significant results between these variables. In a normal sample one can expect 68% of the sample population to fall in the middle range. The majority of the subjects in this sample are neither high nor low dogmatic, but will fall in the middle range, in spite of the fact that all of the parents were assigned high or low categories determined by whether the individual score fell above or below the group mean.

One may also argue that two parents differing in their level of dogmatism (one high, while the other is low), particularly when the mother is low on dogmatism, will have more creative children. The child reared in a home where the parents differ significantly in their thinking, attitudes, and values (assuming the child does not become confused) will, of necessity, be required to think independently and will not be as strongly affected by the modeling of his parents. The greater the contact the mother has with her children can be expected to have an increased relationship with the level of creativity expressed. However, a perusal

of Table 5, Test 1 (Appendix F) reveals, though not significant, that for the 11 and 12 year old children, when the fathers' dogmatism is high the children tend to demonstrate less creativity and when the fathers' dogmatism is low the children tend to display more creativity. This would indicate that the father has the greatest influence on the creativity of his 11 and 12 year old child. The 11 and 12 year old, the early teen, is perhaps being noticed as an individual by most fathers at this time. This is a development period of industry where the child is learning skills from the father (Erickson, 1950). The father may be beginning to spend more time with his children and influencing the child more than when the child was younger and spent more time with his mother. One can expect this may be more true for boys than for girls. Brooks (1975) noted that creative men come from families where artistic expression is rejected by fathers when the son is young. Therefore high dogmatism of fathers ultimately will not necessarily stifle creativity. The creative child whose normal creative expression is rejected at home is likely to find acceptable expression among his peers in rebellious behaviors. These rebellious behaviors may create problems with adults, however, this consequence is already familiar and expected by the rebellious child.

In the two older groups of children, though not statistically significant, creativity is reduced when the parents differ in their level of dogmatism (HL and LH) and

is higher when the parents are the same (HH or LL). This result is compatible with Coopersmith (1967) who noted that consistant, reasonable limit setting increased creativity. The child whose parents are similar in their thinking gets a sense of consistency which is reassuring. As a result the child may have more energy to put into creative activities than the child whose parents differ in their level of dogmatism. This child may be using his energy to defend himself between his parents, or to sort out what he really believes, since his parents do not agree on what they believe.

In addition, one must consider the possibility of the dogmatism test being inappropriate for this study. The Rokeach test is based on the dogmatic thinking of the immediate post war years, more than 16 years ago. The focus of the test is on the values and attitudes of that time. Undoubtedly, these attitudes and values have changed in the ensuing years. Occasionally parents did express confusion over the meanings and implications of some of the questions, suggesting that the test presented a lack of relevance at the time of this testing. This difficulty was not anticipated prior to the testing period. If the test is inappropriate for this study, and a more appropriate test were to be found, the results could be very different.

Hypothesis Two

Dogmatism of the parents will be positively related to the irrational thinking of their children.

This hypothesis was not statistically supported by Tests 3 (ANOVA of youths' irrational thinking, age, and parents' dogmatism) and 4 (ANOVA of youths' irrational thinking, sex, and parents' dogmatism). In contrast, the literature suggests a positive relationship exists between dogmatic thinking and irrational thinking. The Pearson's r correlation between the parents' dogmatism test and the parents' irrational thinking test was .38, suggesting that the tests are correlated or a few of the items in both tests are measuring similar factors. However, these tests have not given support to the suggestions found in the literature.

An interesting further test would have been to separate the fathers and mothers and to examine the relationship of the high dogmatic parent, or of the low dogmatic parent, with their children's irrational thinking. This study is concerned only with the combined effect of the parents' dogmatism in relationship to their children's irrational thinking.

These findings suggest there are factors, other than the dogmatism of the parents, which relate to the irrational thinking of their children. One of these factors, irrational thinking in the parent, will be discussed in hypothesis four.

Hypothesis Three

Irrational thinking of parents will be negatively related to the creativity of their children.

This hypothesis was analyzed by tests 5 (ANOVA of youths' creativity, age, and parents' irrational thinking) and 6 (ANOVA of youths' creativity, sex, and parents' irrational thinking). The hypothesis is not statistically supported.

From the literature it was expected that increased irrational thinking of the parent has a negative relationship with the creativity of the child. The literature is not statistically supported in this study. Rather the statistics suggest that since irrational thinking, which appears to be an aspect of mental health, is not related to creativity, then the mental health of the parents is not related to the creativity of the child. Perhaps parents who model irrationality to their children are inadvertently encouraging creativity through the illogic of their behavior. The illogical, or irrational behavior may enhance or mimic divergent thinking (a component of creativity) to the child.

Another factor associated with creativity and rationality is the acceptance of the created product. It is possible that a created product might appear valueless to one observer and artistic or valuable to another. However, the product might not reflect the creator's ability to cope adequately with life's stresses. Coping adequately and

appropriately with stress requires a degree of mental health. Some creative products might reflect the creator's ability to cope adequately with life's stresses and others not. Since either type of creative product is acceptable in Torrance's definition of creativity, this might tend to obscure any relationship between creativity and irrationality. Throughout the literature and folklore, there is a belief that a positive relationship exists between certain kinds of mental illness and creativity (e.g. William Blake and Vincent Van Gogh). Creativity, however, may be related to factors other than irrational thinking. Such factors may be as unrelated and nebulous as climate, nutrition, birth order, and whether or not the moon is full.

Hypothesis Four

Irrational thinking of the parents will be positively related to the irrational thinking of their children.

This hypothesis was analyzed in Tests 7 (ANOVA of youths' irrational thinking, age, and parents' irrational thinking) and 8 (ANOVA of youths' irrational thinking, sex, and parents' irrational thinking), and is statistically supported in Test 7, while a trend is seen existing in Test 8.

As was anticipated, a modeling effect appears to exist for parents high in irrational thinking to have children who are highly irrational and mothers low in irrational thinking to have children who are also low in irrational thinking.

These statistics suggest that mothers have a greater influence in determining the irrationality of their children as is noted from the tendency for HH parents to have more irrational children than the HL parents regardless of the age of the children. The possibility exists that the greater exposure of the mother to her children accounts for the greater influence on the irrational thinking of her children. It is interesting that there are no interaction effects between the variables. However, examination of Table 5, Tests 7 and 8 (Appendix F) reveals a trend for the HH parents to have the most consistant relationship with their children. That is, in both tests the HH irrational thinking parents have the most irrational children in all age groups and both sex groups.

Hypothesis Five, a

The extent of the relationships described in hypotheses 1, 2, 3, and 4 are dependant on the sex of the child. These hypotheses in summary are: that creativity in children is negatively related to the dogmatism and irrational thinking of their parents; that irrational thinking in children is negatively related to the dogmatic and positively related to the irrational thinking of their parents. This hypothesis was measured in Tests 2, 4, 6, and 8. There was no statistical support found for the parents' variables related to the children's variables on the basis of the sex of the child. This author will take some liberties in

interpretation by commenting on the relationships of the means of these tests as found in Table 5.

Table 5, Test 2 is interesting in providing an indication of opposite sex modeling, as seen in the HL and LH parent groups. In the HL group, sons are more creative than daughters, and in the LH group sons are less creative than daughters. If dogmatism has an inverse relationship to creativity then the parent of the opposite sex positively or negatively reinforces creativity in their children dependent on their level of dogmatism. This same table also reveals that when parents are HH or LL their children are the most creative. This may lend support to the argument (contrary to Dreyer and Wells, 1966) that consistency between the parents in their beliefs releases creative energy in their children.

The opposite directions are revealed in Table 5, Test 4, where the HL and LH dogmatic parents have children LH and HL respectively, in irrationality. That is to say that sons are less irrational when their parents are HL, while daughters are more irrational. And sons are more irrational when their parents are LH, while daughters are less irrational. Sons' irrationality is lower when the mothers' dogmatism is low and sons' irrationality is higher when the mothers' dogmatism is high. The same relationship exists for daughters and their fathers. If dogmatism and irrationality are positively related (r=.38), then the same relationship between parents and children may be true here as in Test 2, where the opposite sex parent has the greatest modeling

effect on the child. (Dauw (1966) found the greatest involvement with the parents of the opposite sex.)

Table 5, Test 6, reveals a trend for parents, both low in irrational thinking, to have daughters who are less creative than are the sons. The opposite effect appears to be true for parents in every other group (HH, HL, LH). The modeling of irrationality by the parents to their children may effect their children differently. That is, when daughters experience irrationality they may reproduce it in creative thinking, while boys may interpret it in a different way.

Table 5, Test 8, reveals a trend that in all groups daughters were more irrational than sons, especially so when both parents are high in irrational thinking.

None of these relationships are statistically significant. Considering the nature of the sample being continuous and not an examination of the extremes of the variables tested these tendencies may be operationally significant, while not statistically so. There is reason here for another study to be run, testing only the extremes of the variables, eliminating the middle group on each variable.

Hypothesis Five, b

Daughters will differ from sons in their creative and irrational thinking.

The statistics reveals a trend for daughters to be more

irrational than sons. This is interesting in light of the strong support given by Davies (1970) that women are more irrational than men. Had the extremes in the sample been compared significance is expected to have been reached.

Traditionally, daughters are encouraged to indulge in mystical, magical thinking (Isaacs, 1972; Piaget, 1926), more than sons who are encouraged to think concretely. Magical thinking, or the belief in unexplainable, mysterious power or forces, apart from religious beliefs, is considered irrational in an adult. It is not rational in a child however, it is a normal part of child development (Alexander, 1969; Erickson, 1950; Singer, 1973). It requires that the mystery of the unknown be explained in the child's own terms. Therefore, one could expect irrational thinking to decrease with age, as adults traditionally develop more logic and reduce magical thinking with maturity (Piaget, 1926). This conclusion is debatable as evidence from observation is that very often irrational adults appear to become more irrational with age. Perhaps the explanation lies in the adult being irrational, rather than the irrational child becoming more rational as the child approaches adulthood and continuing to develop rationally as an adult.

There was no literature found discussing irrational thinking and conformity. Since dogmatic thinking is only loosely related to irrational thinking ($r=.38$), it can not be concluded in this study that conforming youths are more

irrational than nonconforming youths. Conformity is seen as related to creativity since conformity limits creative expression (Coopersmith, 1967; Hacker, 1965; Moustakas, 1967). However, this study does not reveal a significant sex-related difference in creativity. This finding is interesting in light of the literature describing sons as being significantly more creative than daughters (Straus and Straus, 1968; Wilson, 1958). However, Torrance (1961) and Torrance and Dauw (1966) found creativity in sons leveled off from age 10 or 11, resulting in equality with daughters on the creativity variable. The subjects tested in this study were 11 to 16 year old youths which lends theoretical support for there being no significant difference between sons and daughters in creativity after the age of 10.

Hypothesis Six, a

The extent of the relationships described in hypotheses 1, 2, 3, and 4 (Creativity in children is negatively related to the dogmatism and irrational thinking of their parents; that irrational thinking in children is positively related to dogmatism and irrational thinking of their parents) will differ depending on the age range (11 and 12, 13 and 14, and 15 and 16 year olds) of the child.

This hypothesis was measured by Tests 1, 3, 5, and 7 and is not supported on any variable. That is, the relationship between the irrationality or dogmatism of the parents with the irrationality or creativity of their

children does not vary with age. The literature is limited and unclear on this point so this study may add clarification here. It may be worthwhile for another study to be conducted to determine if this is the case.

There is a trend in Table 5, Test 1, for creativity to increase with age when both parents are high or low or LH but not when HL dogmatism. In the age range of 13 to 16 the children of HH and LL dogmatic parents are consistantly more creative than when the parents are HL or LH. The 15 and 16 year olds are the most creative and of this age group the group whose parents are LL are the most highly creative group in the test.

The opposite direction is seen in Table 5, Test 3, where the 11 and 12 year old group is the most irrational in all but the LL dogmatism group of parents. The HH parent group have the most irrational 11 and 12 year olds, with the LH group following close behind. The 13 and 14 year olds have the most irrationality when their mothers are highly dogmatic and the least irrationality when their mothers are less dogmatic. There is no pattern present in the 15 and 16 year old age group. It would appear that on the variable of irrationality that the mother's modeling has the strongest effect on the younger children.

In Table 5, Test 5 the 11 and 12 year olds and the 15 and 16 year olds are more creative when their parents' irrational thinking groups are mixed in irrational thinking. The 13 and 14 year olds are more creative when their mothers

are less irrational. For the latter group mothers still have the greatest influence. The mixed parent groups may give their children more alternatives to consider between the diverse thinking patterns of the parents.

The group means of the most irrational children and the least irrational children in the study are in Table 5, Test 7. The HH irrational thinking parent group has the most irrational children of all the parent groups with the 11 and 12 year olds being the most irrational of the three age groups. This finding is significant. The LL irrational thinking parent group has the least irrational children in two age groups (11 and 12, 15 and 16 years). The least irrational children (who are 13 and 14) have parents in the HL group. There is very little difference between their means and the LL group mean (189 and 191). Here again mother high or low in irrationality has a little more influence on her children than her husbands' irrationality does. The 15 and 16 year old means are the same in all parent groups (192).

In tests 3, 5, and 7 mothers appear to have the greatest influence on the 13 and 14 year old children. It is theorized that 11 and 12 year old children are more concerned with fathers and after a couple of years begin to be influenced by mothers. None of these trends are statistically significant at even the 10% level of confidence. These trends are discussed here for the sake of interest and to indicate the need for another study

examining the extremes in the population.

Hypothesis Six, b

Creative and irrational thinking will vary with the age range of the children.

This hypothesis is supported on the irrational thinking variable on Tests 3 and 7, and is not supported on the creativity variable. Younger children are found to be significantly more irrational than older children. As children approach adulthood they become more rational. They have more knowledge; are more capable of abstract thinking. They are less affected by myths and imagination (Coopersmith, 1967; Piaget, 1926). If the subjects had been younger a statistical difference may have been found as the literature indicates differences exist in creativity in the lower age groups (Torrance, 1961, 1967).

B. Conclusions

Hypotheses Four and Six b were statistically supported with a tendency approaching significance emerging on Hypotheses One, Four, and Five b. The significances were revealed between the youths' age and sex groups, and parents' irrational thinking and their children's irrational thinking rather than between the parents' dogmatism and their children's variables. There were a number of trends emerging from a visual examination of the data. These did

not approach significance.

The trends noted in Table 5, lend themselves to Erickson's (1950) model of child development. The 11 and 12 year old children going into puberty are in the latency stage called Industry by Erickson, where fathers become the focus. Skill development and sex education become issues where fathers may take the major roles. The children are moving away from the safety of mother. Then the 13 and 14 year old children are experiencing an identity period where the safety of the known: mother, becomes important. The mother becomes a stabilizing influence in this period. The 15 and 16 year old children are going through the stage of self definition, an independant period where it is important to the youth not to be influenced by either parent. It is a breakaway time in development which is important before the youth can allow himself to come back, figuratively, to his parents. The notable tendencies are that fathers appear to influence the 11 and 12 year old children as when the fathers are high in dogmatism or irrational thinking they have 11 and 12 year old children who are higher in irrational thinking than the other age groups. Mothers appear to have the greatest influence on 13 and 14 year old children as when mothers are high in dogmatism their 13 and 14 year old children are higher in irrational thinking than the other age groups; when mothers are low in dogmatism or irrational thinking their 13 and 14 year old children are lower in irrational thinking and are more creative than the

other age groups.

The lack of a significant relationship between dogmatism and the youths' variables (creativity and irrationality) may be due in part to the sample being a normal, continuous population and not the extremes in the population on the variables tested. The majority (68%) of the normal population falls in the middle of the normal curve. Therefore what has been called here as "high" dogmatism, creativity, or irrational thinking includes a large medium dogmatic, creative, and irrational population. The same is true for "low" dogmatism, creativity, and irrational thinking. Comparison of two bell curves seems to be all that has taken place. The curves are: adults variable with the child's variable. Viewed from this perspective the trends come closer to significance and are worth paying attention to.

Another possible explanation for the lack of the predicted outcome is in the broad nature of the dogmatic personality. Hart and Brown (1967) points out that the dogmatic personality is both aggressive and submissive, controlling and non-controlling, accepting and rejecting, dependent upon the degree to which the dogmatic beliefs are held and challenged. Thus, individuals with strong dogmatic beliefs may not be significantly influencing other individuals to strengthen or to adopt additional dogmatic beliefs. The modeling of parents becomes less relevant as a child grows older, while at the same time the peer group and

significant others outside the family become more influential (Singer, 1973).

It is interesting to note that the most creative and the least creative children in the study are found in Test 1 where the parents' variable is dogmatism. The most creative group are the 15 and 16 year olds in the LL dogmatism parent group and the daughters are the most creative. The least creative group are the 11 and 12 year olds in the HL group with the sons the least creative (Table 5, Test 1). This is interesting in light of the research by Torrance (1967) indicating that sons are more creative than daughters until about the age of 11 when they <u>begin</u> to level off and equalize with daughters. This study suggests a pattern where girls increase their creativity with age from 11 on. In all cases daughters are more creative, though not significantly so, in all but two cases: on the dogmatism variable when parents are HL, and on the irrational thinking variable when parents are LL. In both instances mothers are low on their variable, while fathers varied on their variable. On the dogmatism/creativity variables the daughters lower creativity may be due to opposite sex modeling, that is the father's high dogmatism may be related to the daughter's low creativity, or it may be due to the parents' mixed belief systems creating barriers to creativity in the daughter. More information is necessary before it can be determined what the rationale behind these relationships are.

As an openminded person ages, increasing knowledge and

understanding through experience, it is probable that he will become less influenced by irrational ideas. The closed minded person can be expected to become more irrational with time as life experiences are interpreted to reinforce his irrational beliefs. However, this would not explain the results showing that daughters do think more irrationally than do sons. The explanation may lie in magical thinking which is more overtly the domain of daughters than of sons, who appear to be encouraged to be more logical in their thinking.

There is a case here for presenting to children reality, along with fantasy and magic. While fantasy is relaxing and fun, and essential in the creative process, it can, when believed, create a chain reaction of irrational beliefs which later in life can be altered only through conscious effort and experience. Fairy tales and myths teach the morals and values of society. At the same time they may reinforce the beginnings of irrational beliefs, eg. that beautiful women will be loved by everyone; princesses (girls) need to be rescued (dependency); if you are beautiful, and therefore loved, you will not have to face hardship and responsibility; there are people who are totally evil and should be severely punished; and a prince (boy) must be handsome, competent, and achieving to win (be worthwhile, or be loved). The child accepts many of these ideas which are reinforced by parental reactions to their "beautiful" daughters and "competent" sons. Children may

believe that their survival is based upon following these myths, for if they don't they will become unlovable and worthless. This society's entire merchandising and advertising systems are dependant, as well as based on these beliefs. The constant reminders through radio and TV of these irrational beliefs reinforces them in the believer. It becomes the challenge, as well as the responsibility, of the parents to teach and encourage their children to appropriately distinquish between reality and myth. As children become more creative, their ability to cope with societal stress can be expected to increase.

While stress has a profound effect upon the mental health of a society, it can enhance the rationality of the society as new coping mechanisms are, by necessity, developed.

C. Implications for Therapy

In the Discussion section, Hypothesis One, the suggestion was made that rebellious children may be seeking an outlet for their creative drive. This outlet may be with the peer group and against the accepted norms of the adults in the child's life. The therapist with a young, rebellious client would be wise to look for signs of creativity in the client and together seek alternatives for creative expression which are acceptable to both the adults and the peer group. The parents of this child may be assisted in

understanding their child's behavior as a need to express creativity and helped to develop a bond with the child rather than to be against the child. This suggestion for therapy does not presuppose there are no other issues of which the rebellious behavior is a symptom.

In treating a child who is highly irrational, it is theoretically sound to call the parents in for therapy with the child. It can be expected from the results of this study that the parents will also be highly irrational. Due to the reinforcing parents do with their children it would be futile or difficult to treat the child without the parent, and to expect the therapy to have any lasting effects on the child. The parent on the long term can be expected to have a greater effect on the child than the therapist through a variety of reinforcing patterns available within the family system. The reinforcement may be through reward and punishment by the parent withholding or giving affection or acceptance, either consistantly or intermittantly, to the child. One must keep in mind that all members of the family have an effect on all other members of the family. Each family member may be reinforcing behaviors in a family member. Thus the entire family needs to worked with for change to occur in one member.

The child is dependent on his parents for his sense of well being as well as his physical needs. Thus when the parents form an alliance against the child in order to control the child, the power is sufficient that most

children will change their behavior, and thus the thinking that determine the behavior, in order to gain a reward such as love or acceptance. The child who resists this power has little recourse, in order to survive, but to rebel (often an expression of creativity) or to become alienated from all the significant other people in the child's world. The latter is so intolerable that it can be expected to be found only in extremely disfunctional children such as childhood schizophrenia (Bettelheim, 1967; Kanner, 1953; Urbina, 1973).

One of the variables in families is the attention the parent gives the child. The child who behaves appropriately for the parent may experience increased or decreased attention from the parent. Whichever the child receives will help determine the behavior the child chooses under similar circumstances. Other variables are the intelligence of the child and the child's ability to sort, analyze and assemble information he acquires in his family, as well as outside the family. Therefore, a therapist would find it more profitable to work with the parents in the family system than with the child alone. It is also highly possible that the child, treated alone, would become trapped in a power struggle between the therapist and the family system. This power struggle is wasteful of energy and time, and destructive to future attempts at therapeutic intervention.

D. Implications for Further Study

The following statements are suggestions for further research as a result of the findings of this study.

1. This study could be repeated using a larger sample size to determine if a significant relationship does exist on these variables, as on Tests 5 and 7 the sample was too small to be considered relevant.
2. A more statistically significant study may be made by testing the extremes in the population on each of the variables, rather than having a continuous population as in this study.
3. The study could be repeated with a younger population to determine if a more significant relationship would emerge using these same variables, at a younger age level.
4. An analysis of the fathers' variables vs. the mothers' variables to determine if a relationship would emerge with the children being affected differently.
5. The development of a dogmatism test specific to the Canadian society in the 1970's may reveal interesting and different statistical results from this study. In order to design an appropriate test to determine level of dogmatism of the sample, a problem exists in determining what is the Canadian norm for attitudes and values.
6. A study of the relationship of creativity in parents to

the creativity in their children, may reveal interesting results.

7. A test conducted over time, such as five years, could prove valuable to determine if a change takes place with time within the family system in any one of the variables.
8. Further study is needed of the relationship conformity has with irrational thinking, dogmatism, and creativity.
9. A study could be made of the relationship of the classroom environment and the home environment with the creative thinking of the child.
10. A contribution to understanding families may come from a study of the relationship of family size and the level of dogmatism, creativity, and irrational thinking in the family.
11. An indepth study of the communication system in the family and its reinforcement of the creativity, irrational thinking, or dogmatism of its members would be valuable.

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APPENDIX A

IRRATIONAL IDEAS

IRRATIONAL IDEA NO. 1:

IT IS A DIRE NECESSITY FOR AN ADULT HUMAN BEING TO BE LOVED OR APPROVED BY VIRTUALLY EVERY SIGNIFICANT OTHER PERSON IN THE COMMUNITY.

IRRATIONAL IDEA NO. 2:

ONE SHOULD BE COMPLETELY COMPETENT, ADEQUATE AND ACHIEVING IN ALL RESPECTS IF ONE IS TO CONSIDER ONESELF WORTHWHILE.

IRRATIONAL IDEA NO. 3:

CERTAIN PEOPLE ARE BAD, WICKED, OR VILLAINOUS AND SHOULD BE SEVERELY BLAMED OR PUNISHED FOR THEIR EVIL.

IRRATIONAL IDEA NO. 4:

IT IS CATASTROPHIC WHEN THINGS ARE NOT THE WAY ONE WOULD LIKE THEM TO BE.

IRRATIONAL IDEA NO. 5:

UNHAPPINESS IS EXTERNALLY CAUSED AND ONE HAS LITTLE OR NO CONTROL OVER THEIR SORROWS AND DISTURBANCES.

IRRATIONAL IDEA NO. 6:

ONE SHOULD BE TERRIBLY CONCERNED ABOUT DANGEROUS OR FEARSOME THINGS AND ONE SHOULD CONTINUOUSLY DWELL ON THE POSSIBILITY OF IT OCCURRING.

IRRATIONAL IDEA NO. 7:

IT IS EASIER (BETTER) TO AVOID THAN TO FACE CERTAIN OF LIFE'S DIFFICULTIES AND RESPONSIBILITIES.

IRRATIONAL IDEA NO. 8:

ONE SHOULD BE DEPENDENT AND NEED SOMEONE STRONGER ON WHOM TO RELY.

IRRATIONAL IDEA NO. 9:

AN EVENT OCCURING IN ONE'S PAST, STRONGLY AFFECTING ONE'S LIFE, WILL ALWAYS HAVE A SIMILAR EFFECT WHEN IT OCCURS AGAIN.

IRRATIONAL IDEA NO. 10:

ONE SHOULD BECOME QUITE UPSET OVER OTHER PEOPLES PROBLEMS AND DISTURBANCES.

IRRATIONAL IDEA NO. 11:

THERE IS ALWAYS ONE RIGHT, PRECISE, PERFECT SOLUTION TO ANY HUMAN PROBLEM AND IT IS CATASTROPHIC IF THIS SOLUTION IS NOT FOUND. [1]

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[1] See Ellis (1962), page 61ff for a fuller statement of each idea.

APPENDIX B

LETTER TO FAMILIES

Dear Mr & Mrs

I am a professor from the University of Alberta who has a special interest in families and the way families work. A graduate student named Linda Lees and I are conducting a study designed to give information about how healthy qualities are developed within a family setting.

This study will involve administering questionnaires, that take approximately an hour to complete, to hundreds of families in Edmonton. The questionnaires are not signed by the families and all information remains anonymous. We have selected families randomly among those in the City which have children within the ages of eleven and sixteen. Your family is one of those selected.

I am telling you a little about the study before we call your home to ask if you are willing to participate, so you will understand that this is University sponsored research.

You should be receiving a phone call within the next couple of weeks and will have an opportunity to raise any concerns that you might have after reading this letter. It

would be helpful to us if you could raise the possibility of participating in this study with the other family members before the phone call.

If you decide you are willing to donate an hour of your family's time, an interviewer will arrange an appointment at your convenience to administer the questionnaire in your home or at the University. After seeing the questionnaire you are still quite free to change your mind. Your generosity in considering this will be most appreciated by myself, Linda, and the others working together with us on this project.

Sincerely,

Sally Goforth, PH.D.

SG:dlp

APPENDIX C

TRAINING MATERIALS

Interviewer Kit Checklist

1. List of names and phone numbers.
2. Appointment book.
3. Copy of mailed out letter.
4. Instructions to Interviewers.
5. Telephone speech.
6. Potential questions.
7. Sets of question booklets: Adult and Youth.
8. Timer.
9. Pencils.
10. Container for equipment.
11. Phone number:
12. optional: Card table.

Instructions to Interviewers

1. Be yourself.
2. The hope is that you will be friendly yet professional.
3. Be sure of yourself before phoning. Contact me if you have any questions or concerns.
4. Make an honest attempt to answer every question, and simply.
5. Avoid "big" words, "jargon" or long sentences.
6. Never argue. Agree where possible and keep the conversation simple. Try to skip to their agreement to setting an appointment date, time and place.
7. Keep the discussion on the topic. If it is wandering you could say "I would like to discuss that with you, however I'd like to make an appointment with you just now."
8. If there is a serious language problem don't try further with the family as they likely would have difficulties reading the English questionaires.
9. If the response is very negative then feel free to end the call, or ask about an appointment before ending the call.
10. After making the apointment be sure to phone the family before going to them, thus possibly saving yourself some inconveniences. Check the address with the family and directions for getting there when you call before leaving.
11. If the is a difficulty such as a retarded child, if possible, go ahead and administer the questionnaire, giving individual attention such as reading the questions where necessary.
12. Do not administer to blind or obviously inebriated persons.
13. Seat participants around a table, eg. the kitchen table, with the parents sitting opposite each other.

Telephone Speech

(Speak in a slow, distinct, moderate and comfortable tone. A friendly and relaxed frame of mind at the time of making the call will help.)
"Hello, is this Mr./Mrs. ____?" (pause)
(If the last name is different from child's name ask: "Are you the parent of ____?" Give your name before asking for their name.)
This is ____. I am phoning about the letter from Dr. Sally Goforth of the University of Alberta, you or Mr./Mrs. _____ received recently. Do you remember receiving the letter?" (pause)
(If respondant is not sure, then mention the contents of the letter before going on.)
"I want to explain what it is that we are asking you to do in the research. (pause) "Dr. Goforth and Linda Lees have assembled a questionnaire, to be given to each parent and each child between 11 and 16 years, in the family."

"We are gathering information which will show how the ideas that ordinary families have, influence the normal creative development in their families. This is important in understanding how families work."

"Have you talked to your family about this?" (pause) "I would like to go ahead and set up an appointment with you, and you can talk with your family (further) about it in the meantime."
(Arrange: 1. place, 2. day, and 3. time. Leave your phone number if you are comfortable doing this.)
"How many children do you have between 11 and 16 years? It is important that both you and your wife/husband and your child/children be present at the same time." (Ad lib from here and end call)
(If respondant does not wish to participate, then politely end with: "Thank you for considering it and I can understand that you don't wish to participate." If the answer is positive, then set up the details of the appointment and end with: "We really do apppreciate your willingness to take part when families are so busy these days.")

Potential Questions

1. "Why me?" or "What does random mean?" Your name was picked from a list of many names of families who have children between the ages of 11 and 16. You were chosen kind of by accident. We will continue to call families until we get enough participants then we will stop calling.
2. "What's in it for me ?" You have the opportunity to enter into a fine study which will ultimately help other families. (Stop here unless more information is requested.) The questionnaires are interesting, fun and thought provoking. Your family would likely want to discuss them privately afterwards. Also, you will be provided with a summary of the results of the study once it is finished, if you wish it.
3. "I don't like people prying into my life." Neither do I (or: I can understand a feeling like that and--). One of the things I like about this study is that you have the option of not answering any questions you feel is prying. This is a research project designed to help others and no names are being used.
4. "Is my kid in trouble at school?" This has nothing to do with you child in his school. It is a study of ordinary families.
5. "How did you get my name?" I believe it was through a research department, however do phone her and she'd be happy to discuss it with you.
6. "How much will this cost me?" There is no fee. We only ask for an hour of your time.
7. "Why are you doing the study?" To gather information about ordinary families.
8. "What guarantee do I have that the information I give is anonymous and will not be used against me?" No identifying marks are to be put on the questionnaire or we can not use the information. There is no way then for the information to be linked to you.
9. "Are you from --------(maybe a credit bureau)?" Does ____worry you? I'm from the University of Alberta and no knowledge of ___.
10. "What if my child won't co-operate?" Well go ahead and ask him. As long as one 11 to 16 year old and both parents are present we can go on.
11. " How much time will it take?" Less than an hour.
12. " Where do I have to go?" We will make an appointment to meet in your home or in the university if you prefer. Usually the appointments are made for the evening when everyone can be present.
13. "Will I be with other people?" You will be with you family and me, only.

14. "Who else will read this stuff ?" I guess you are worried about your privacy. The booklets are anonymous. Linda gets all the booklets to score herself and she do es not know who you are.
15. "What about my 4 year old an d my 17 year old?" We are not giving the questionnaires to any child under 11 or over 16.
16. "I have a friend with two children that age, how about them?" Thank you for offering, however it is possible your friend will be contacted by random choosing. We are not phoning friends of those families selected at random.
17. "I have a friend who answered one of those questionnaires and really got into trouble?" I can understand you being worried if that happened to your friend, however since your name will be in no way connected to the questionnaire there is no way that can happen to you.
18. "It will cost me money to go down to that university to do that for you." Most people take the questionnaire in their own homes so they don't have to go out. We have no funds for reinbursing you for transportation.
19. "Do you get paid for this?"
20. "There is no way I will be able to get the children to take this exam. I don't like exams myself ." I guess I can understand that as I don't like exams either. This isn't an exam. Some simple drawings to be made and some questions answered is all that is required.
21. "There is no way the children will agree to co-operate." The questionnaires are fun to do and interesting so perhaps if you'll ask them they may agree to try something new. I think they will find it fun. I am willing to go ahead and set an appointment time, now, and see what happens.
22. "I don't want any IQ test." This is not an IQ test. The questionnaire has nothing to do with IQ and the study is not interested in IQ. however I can understand your concern there.

Instructions for Administration of the Questionnaires

(The psychological climate both preceding and during the use of the questionnaires, should be as comfortable and stimulating as possible. Have the questionnaires and pencils ready. Instructions are to be read as written, without modification.)

1. Adults' Questionnaire.

The instructions for the adults are written above the two questionnaires. Point this out to the adults, showing them where the instructions change and how to go about marking the questions. Patiently answer their questions. Encourage them to find an answer to each question, however if the question invades their privacy, even though the questionnaire is anonymous, then the question may be left unanswered.

2. Youths' Questionnaire.

Read as written:

"You will be doing some thing that will give you a chance to see how good you are at thinking up new ideas and solving problems. They will call for all of the imagination and thinking ability you have. I want you to injoy yourself while you are thinking."

"I will tell you when to open the booklet."

(wait, assist if necessary)

I will read the instructions to you:

"In this booklet are three interesting things for you to do. All of them will give you a chance to use your imagination to think of ideas and to put them together in various ways. In each activity, we want you to think of the most interesting and unusual ideas you can - ideas that no one else will think of. After you think of an idea keep adding to it. and build it up so that it will tell the most interesting and exciting story possible.

"You will be given a time limit on each activity, so make good use of your time. Work fast but don't rush. Try to keep thinking of ideas, but if you run out of ideas before time is called, sit quietly and wait until you are told to turn to the next page.

"If you have any questions after we start, don't speak out loud. Just nod to me and I will try to answer your questions."

If there are no questions at this point, proceed with the first activity. If there are questions concerning the instructions, attempt to satisfy them by repeating the instructions in words that the person will understand or by elaborating upon the instructions in the printed booklet. Avoid giving examples or illustrations of "model responses". This tends to reduce originality and in some cases it even reduces the number of responses produced. Above all, attempt to maintain a friendly, comfortable, warm relationship with the group.

"Now turn the page and read the instructions at the top of the page. (pause) Move the coloured paper to the next page and stick it where you want it. Then add lines with your pencil to make your picture.

"Try to think of a picture that no one else will think of. Keep adding new ideas to your first idea to make it tell as interesting and exciting a story as you can.

"When you have completed your picture, think up a name or title for it and write it at the bottom of the page in the space provided. Make your title as clever and unusual as possible. Use it to help you tell your story.

"Go ahead with your picture, making it different from anyone else's and making it tell as complete and as interesting a story as possible. You have ten minutes."

(start timing)

At the end of about nine minutes, those who have not yet entered a title for their drawing on the line at the bottom of page 3 may be reminded that they are to do so and encouraged to accomplish it.

Using a stop watch, allow TEN MINUTES before calling time. Ask the youths to turn to page 4, Activity 2: Picture Completion. Again, ask them to read the instructions to you:

"By adding lines to the incomplete figures on this and the next page, you can sketch some interesting objects or pictures. Try to make it tell as complete and as interesting a story as you can by adding to and building up yourk first idea. Make up an interestring title for each of youur drawings and write it at the bottom of each block next to the number of the figure.

"All right, go ahead. You will have ten minutes."

(start timing)

If some examinee s are upset by the fact that they did not finish, reassure them very simply by saying something like the following:

"I notice that you work in different ways. One works more quickly than the other then goes back to check and the other didn't finish howeve r you put more time into the drawing to make it tell a story. Continue to work in whatever way is natural and comfortable for you."

Using a stop watch, allow TEN MINUTES before calling time. Ask the pupils to turn to page 6, Activity 3: Circles. Again, read the instructions with them:

"In ten minutes see how many objects or pictures you can make from the circles below an d on the next page. The circles should be the main part of whatever you make. With your pencil add lines to the circles to complete your

picture. You can place marks inside the circles, outside the circles, or both inside and outside the circles - wherever you want to in order to make your picture. Try to think of things that no one else will think of. Make as many different pictures or objects as you can and put as many ideas as you can in each one. Make them tell as complete and as interesting a story as you can. Add names or titles below the objects.

"All right, go ahead. You have ten minutes ."

After TEN MINUTES call time and ask them to turn the page. You may need to allow a moment or so for the person to add a title or two to their drawings. Otherwise, reliable scoring of the pictures will not be possible.

Go over the instructions for the questionnaire. Explain that the questions are not timed and the exercise is finished when the questions are finished. Encourage them to find an answer to each question.

Collect the test booklets. Be sure to leave the letter to the parents with the parents and thank them for their co-operation. Keep the address if they want a summany sheet mailed to them. Leave quickly.

APPENDIX D

TESTING BATTERIES

1. ADULTS

2. YOUTHS

ADULT TEST BATTERY

Dear Parents,

Thank you for agreeing to take part in this study. Your help is sincerely appreciated and will contribute to information about how families develop.

If questions arise after you have completed the questionnaires, please feel free to call either myself or Linda Lees at phone number _____. Let me remind you again that this information remains anonymous and you are asked not to write your names on the booklet

Sincerely,

Sally Goforth, PH.D.

Linda Lees, B.Sc.

Interviewer's Name:_____

Form E

The following is a study of what the general public thinks and feels about a number of important social and personal questions. The best answer to each statement below is your personal opinion. We have tried to cover many different and opposing points of view; you may find yourself agreeing strongly with some of the statements, disagreeing just as strongly with others, and perhaps uncertain about others; whether you agree or disagree with any statement, you can be sure that many people feel the same as you do.

Mark each statement in the left margin according to how much you agree or disagree with it. Please mark every one.

Write 1, 2, 3, or -1, -2, -3, depending on how you feel in each case.

1: I AGREE A LITTLE	-1: I DISAGREE A LITTLE
2: I AGREE ON THE WHOLE	-2: I DISAGREE ON THE WHOLE
3: I AGREE VERY MUCH	-3: I DISAGREE VERY MUCH

1. The United States and Russia have just about nothing in common.
2. The highest form of government is a democracy and the highest form of democracy is a government run by those who are most intellegent.
3. Even though freedom of speech for all groups is a worthwhile goal, it is unfortunately necessary to restrict the freedom of certain political groups.
4. It is only natural that a person would have a much better acquaintance with ideas he believes in than with ideas he opposes.
5. Man on his own is a helpless and miserable creature.
6. Fundamentally, the world we live in is a pretty lonesome place.
7. Most people just don't give a "damn" for others.
8. I'd like it if I could find someone who would tell me how to solve my personal problems.
9. It is only natural for a person to be rather fearful of the future.
10. There is so much to be done and so little time to do it in.
11. Once I get wound up in a heated discussion I just can't stop.
12. In a discussion I generally become so absorbed in what I am going to say that I forget to listen to what the others are saying.

13. In a discussion I often find it necessary to repeat myself several times to make sure I am being understood.
14. It is better to be a dead hero than to be a live coward.
15. While I don't like to admit this even to myself, my secret ambition is to become a great man, like Einstein, or Beethoven, or Shakespeare.
16. The main thing in life is for a person to want to do something important.
17. If given the chance I would do something of great benefit to the world.
18. In the history of mankind there have probably been just a handful of really great thinkers.
19. There are a number of people I have come to hate because of the things they stand for.
20. A man who does not believe in some great cause has not really lived.
21. It is only when a person devotes himself to an ideal or cause that life becomes meaningful.
22. Of all the different philosophies which exist in this world there is probably only one which is correct.
23. A person who gets enthusiastic about too many causes is likely to be a pretty "wishy-washy" sort of person.
24. To compromise with our political opponents is dangerous because it usually leads to the betrayal of our own side.
25. When it comes to differences of opinion in religion we must be careful not to compromise with those who believe differently from the way we do.
26. In times like these, a person must be pretty selfish if he considers primarily his own happiness.
27. The worst crime a person could commit is to attack publicly the people who believe in the same thing he does.
28. In times like these it is often necessary to be more on guard against ideas put out by people or groups in one's own camp than by those in the opposing camp.
29. A group which tolerates too much differences of opinion among its own members cannot exist for long.
30. There are two kinds of people in this world: those who are for the truth and those who are against the truth.
31. My blood boils whenever a person stubbornly refuses to admit he's wrong.
32. A person who thinks primarily of his own happiness is beneath contempt.
33. Most of the ideas which get printed nowadays aren't worth the paper they are printed on.
34. In this complicated world of ours the only way we can know what's going on is to rely on leaders or experts who can be trusted.

35. It is often desirable to reserve judgement about what's going on until one has had a chance to hear the opinions of those one respects.
36. In the long run the best way to live is to pick friends and associates whose tastes and beliefs are the same as one's own.
37. The present is all too often full of unhappiness. It is only the future that counts.
38. If a man is to accomplish his mission in life it is sometimes necessary to gamble "all or nothing at all".
39. Unfortunately, a good many people with whom I have discussed important social and moral problems don't really understand what's good for them.
40. Most people just don't know what's good for them.

AII

Read each of the following statements and decide how much you agree or disagree. Use the code shown below.

A. I STRONGLY AGREE C. UNDECIDED D. I DISAGREE

B. I AGREE E. I STRONGLY DISAGREE

Put your answer on the line in the margin.

1. Jeers humiliate me even when I know I am right.
2. I worry about situations where I am being tested.
3. The best way to teach a child right from wrong is to spank him when he is wrong.
4. I must learn to "keep my head" when things go wrong.
5. I think I am getting a fair deal in life.
6. I worry about eternity.
7. I am happiest when I am sitting around doing little or nothing
8. I prefer to be independent of others in making decisions.
9. If a person is ill-tempered and moody, he will probably never change.
10. I get very upset when I hear of people (not close relatives or friends) who are very ill.
11. Crime never pays.
12. My family and close friends do not take enough time to become acquainted with my problems.
13. People who do not achieve competency in at least one area are worthless.
14. We are justified in refusing to forgive our enemies.
15. I frequently feel unhappy with my appearance.
16. I feel that life has a great deal more happiness than trouble.
17. I worry over possible misfortunes.
18. I often spend more time in trying to think of ways of getting out of something than it would take me to do it.
19. I tend to look to others for the kind of behavior they approve as right and wrong.
20. Some people are dull and unimaginative because of defective training as a child.
21. Helping others is the very basis of life.
22. School promotions should be for intellectual merit alone.
23. It is very important to me when I do a good job to be praised.
24. I find it difficult to take criticism without feeling hurt.
25. It is terribly upsetting the way some students seem to be constantly protesting about one thing or another.
26. It is impossible at any given time to change one's emotions.

27. I tend to worry about possible accidents and disasters.
28. I need to learn how to keep from being too assertive or too bold.
29. To cooperate with others is better than doing what you feel should be done.
30. Sympathy is the most beautiful emotion of man.
31. People who criticize the government are either ignorant or foolish.
32. I wish that more affection were shown by members of my family.
33. When a person is no longer interested in doing his best, he is done for.
34. I get very angry when I miss a bus which passes only a few feet away from me.
35. My place of employment and/or my neighborhood provide adequate opportunity for me to meet and make friends.
36. I can walk past a grave yard alone at night without feeling uneasy.
37. I avoid inviting others to my home because it is not as nice as theirs.
38. I prefer to have someone with me when I receive bad news.
39. It is necessary to be especially friendly to new co-workers and neighbors.
40. The good person is usually right.
41. Sometimes I feel that no one loves me.
42. I worry about little things.
43. Riches are a surer basis for happiness in the home.
44. I can face a difficult task without fear.
45. I usually try to avoid doing chores which I dislike doing.
46. I like to bear responsibilities alone.
47. Other peoples problems frequently cause me great concern.
48. It is sinful to doubt the bible.
49. It makes me very uncomfortable to be different.
50. I get terribly upset and miserable when things are not the way I would like them to be.
51. I find that my occupation and social life tends to make me unhappy.
52. I am afraid in the dark.
53. Many people that I know are so unkind or unfriendly that I avoid them.
54. It is better to take risks and to commit possible errors, than to seek unnecessary aid of others.
55. I get disturbed when neighbors are very harsh with their little children.
56. I find it very upsetting when very important people are indifferent to me.
57. I have sometimes had a nickname which upset me.
58. I have sometimes crossed the street to avoid meeting some person.
59. When a friend ignores me I become extremely upset.
60. My feelings are easily hurt.

YOUTHS TEST BATTERY

II

What to do: This is a study of events and experiences in everyday life. You are asked to cooperate seriously and carefully in marking items in this questionnaire. This is not an intelligence test. The best answer to each statement is your own first impression - there are no right answers. Let your own personal experience or opinion guide you to choose the answer you feel about each statement .

A. I STRONGLY AGREE C. UNDECIDED D. I DISAGREE

B. I AGREE E. I STRONGLY DISAGREE

Put your answer on the line in the margin.

1. I usually object when a person steps in front of me in a line of people.
2. I have sometimes had a nickname which I didn't like very well.
3. I prefer to accept suggestions rather than work them out for myself.
4. Men are created equal in mental capacity.
5. To spare the rod is to spoil the child.
6. I worry about little things.
7. There are people who try to do me harm or hurt me.
8. I sometimes worry about my health.
9. I like to bear responsibilities alone.
10. It is a big aid to health to say each morning, "Day by day in every way I am getting better and better".
11. I prefer to have someone with me when I receive bad news.
12. Sympathy is the most divine passion of the human heart.
13. The good person is usually right.
14. Sometimes I feel that no one loves me.
15. I find it difficult to take criticism without feeling hurt.
16. We are justified in refusing to forgive our enemies.
17. I worry over possible misfortunes.
18. I prefer to be alone.
19. I get disturbed when neighbours are very harsh with their little children.
20. I find it easy to set standards of "right" and "wrong".
21. Jeers humiliate me even when I know that I am right.
22. Punishment is a sure cure for crime.
23. My feelings are easily hurt.
24. Sometimes I am troubled by thoughts of death.

25. My folks are not reasonable to me when they demand obedience.
26. I get annoyed when people are impolite to me.
27. I get terribly upset and miserable when things are not the way I would like them to be.
28. I worry about eternity.
29. Children outgrow their bad habits.
30. I get upset when I hear of people (not relatives or close friends) who are very ill.
31. My folks do not take time to become acquainted with my problems.
32. The members of my family seem to criticize me a lot.
33. I get very angry when I miss a bus which passes only a few feet away from me.
34. I can walk past a graveyard alone at night without feeling uneasy.
35. I usually like to be somewhere else than at home.
36. Other people's problems frequently cause me great concern.
37. I wish that more affection were shown by more members of my family.
38. I worry about tests.
39. When things are not the way I would like them to be, and it is not in my power to change them, I calmly accept things the way they are.
40. I feel that life has a great deal more happiness than trouble.
41. I can face a difficult task without worry.
42. I prefer to be independent of others in making decisions.
43. A juvenile delinquent will almost surely be a criminal when he becomes an adult.
44. He that loses his conscience has nothing left that is worth keeping.
45. My folks appear to doubt whether I will be successful.
46. I tend to worry over possible troubles.
47. Many of my fellow students are so unkind or unfriendly that I avoid them.
48. If a child is brought up in a home where there is much quarrelling and unhappiness he will probably be unhappy in his own marriage.
49. When a friend ignores me I become extremely upset.
50. If a person tries hard enough, he can be first in anything.
51. The police may sometimes be right in giving a man the "third degree" to make him talk.
52. It hurts me when my friends are unkind.
53. I worry about the possibility of an atomic attack by some foreign power.
54. I often spend more time in trying to think of ways of getting out of something than it would take me to do it.

55. I feel my parents have dominated me too much.
56. I know there is a God.
57. I find it very upsetting when people who are important to me are indifferent to me.
58. When a person is no longer interested in doing his best he is done for.
59. The best way to teach a child right from is to spank him when he is wrong.
60. It is impossible at any given time to change one's emotions.
61. It is sinful to doubt the Bible.
62. It makes me uncomfortable to be different.
63. I am naturally a lazy person.
64. Persons who are punished for their "sins" usually change for the better.
65. Most people can be truly outstanding in at least one area of their work.

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"THINKING CREATIVELY WITH PICTURES"

BY E. PAUL TORRANCE

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APPENDIX E

SCORING GUIDE

Form E

1. Add 4 to each score the total so that there will be one total for the 40 questions.
2. Put the total on the front page.

AII Inventory

1. All items score:
   a. 5 for SA
   b. 4 for A
   c. 3 for I
   d. 2 for D
   e. 1 for SD
   except items #5, #8, #16, #35, #36, #44, #46, #54 which score backwards:
   1) 1 for SA
   2) 2 for A
   3) 3 for I
   4) 4 for D
   5) 5 for SD

II Inventory

1. All items score:
   a. 5 for SA
   b. 4 for A
   c. 3 for I
   d. 2 for D
   e. 1 for SD
   except #4, #9, #10, #18, #25, #29, #34, #39, #40, #41, #42, #55 which score backwards:
   1) 1 for SA
   2) 2 for A
   3) 3 for I
   4) 4 for D
   5) 5 for SD
2. Highest possible score is 325, lowest is 65.

APPENDIX F

STATISTICAL TABLES

TABLE 4. SIZE OF SAMPLE POPULATIONS.

PARENT Groups:	HH	LL	HL	LH
PARENT PAIRS:				
DOGMATISM	27	34	23	16
AII	28	34	25	13
TESTS 1 AND 3:				
11 AND 12 YEARS	13	18	14	10
13 AND 14 YEARS	11	23	15	12
15 AND 16 YEARS	16	16	9	10
TOTAL	40	57	38	32
TESTS 2 AND 4:				
SONS	23	30	21	12
DAUGHTERS	17	27	17	20
TOTAL	40	57	38	32
TESTS 5 AND 7:				
11 AND 12 YEARS	15	22	10	8
13 AND 14 YEARS	11	20	19	11
15 AND 16 YEARS	21	16	10	4
TOTAL	47	58	39	23
TESTS 6 AND 8:				
SONS	26	30	19	11
DAUGHTERS	21	28	20	12
TOTAL	47	58	39	23

Table 5. Within Cell Means of Children's Groups on Each Test.

DOGMATISM AND CREATIVITY:

Test 1:	HH	LL	HL	LH
11 and 12 years	115	131	110	124
13 and 14 years	130	138	125	122
15 and 16 years	142	153	122	115

Test 2	HH	LL	HL	LH
Sons	127	136	122	111
Daughters	134	144	115	127

DOGMATISM AND YOUTH IRRATIONAL THINKING:

Test 3	HH	LL	HL	LH
11 and 12 years	209	206	201	204
13 and 14 years	200	190	192	198
15 and 16 years	190	195	191	191

Test 4	HH	LL	HL	LH
Sons	198	195	187	199
Daughters	201	198	204	197

ADULT IRRATIONAL THINKING AND CREATIVITY:

Test 5	HH	LL	HL	LH
11 and 12 years	118	117	122	131
13 and 14 years	115	138	133	127
15 and 16 years	132	138	143	143

Test 6	HH	LL	HL	LH
Sons	116	136	125	129
Daughters	133	124	140	134

ADULT AND YOUTH IRRATIONAL THINKING:

Test 7	HH	LL	HL	LH
11 and 12 years	215	200	203	205
13 and 14 years	206	191	189	195
15 and 16 years	192	192	192	192

Test 8	HH	LL	HL	LH
Sons	199	193	191	193
Daughters	207	197	196	202

Table 6. Probability Matrix for Scheffé Multiple Comparison of Parents' Dogmatism Group Using Children's Creativity Scores by Age Group.

Group		HH	LL	HL	LH
HH	F		0.51	0.33	0.21
	P	1.00	0.68	0.80	0.89
LL	F			1.75	1.35
	P		1.00	0.16	0.26
HL	F				0.01
	P			1.00	1.00
LL	F				
	P				1.00

Table 8. Probability Matrix of Scheffé Multiple Comparison of Parents' Dogmatism Group Using Children's Creativity Scores by Sex Group.

Group		HH	LL	HL	LH
HH	F		0.36	0.49	0.40
	P	1.00	0.79	0.69	0.75
LL	F			1.83	1.51
	P		1.00	0.14	0.21
HL	F				0.001
	P			1.00	1.00
LH	F				
	P				1.00

Table 18. Probability Matrix of Scheffé Multiple Comparison of Parents' Irrational Thinking Group with Children's Irrational Thinking Scores by Sex Group.

Group		HH	LL	HL	LH
HH	F		1.69	1.93	0.41
	P	1.00	0.17	0.13	0.75
LL	F			0.05	0.14
	P		1.00	0.99	0.93
HL	F				0.28
	P			1.00	0.84
LH	F				
	P				1.00